



SEQUENCE LISTING

<110> Bell, John C.
Sonenberg, Nahum
Stojdl, David F.
Brown, Earl G.
Atkins, Harold L.
Marius, Ricardo M.
Lichty, Brian D.
Knowles, Shane B.

<120> ONCOLYTIC VIRUS

<130> 18003-D2

<140> US 10/743,649

<141> 2003-12-22

<150> US 09/664,444

<151> 2000-09-18

<150> 60/287,590

<151> 1999-09-17

<160> 52

<170> PatentIn Ver. 2.1

<210> 1

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<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic
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<211> 12

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<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic
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<210> 3

<211> 11
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<213> Artificial Sequence

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1 5 10

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<210> 6
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<223> Description of Artificial Sequence: Synthetic peptide

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Cys Asp Asn Asn His His His His Cys

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5

<210> 8

<211> 10

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<213> Artificial Sequence

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<210> 9

<211> 1269

<212> DNA

<213> Vesicular stomatitis virus

<400> 9

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<210> 10

<211> 1269

<212> DNA

<213> Vesicular stomatitis virus

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<210> 11

<211> 1269

<212> DNA

<213> Vesicular stomatitis virus

<400> 11

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gacaaatga 1269
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<210> 12
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 <212> DNA
 <213> Vesicular stomatitis virus

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<210> 13
 <211> 1029
 <212> DNA
 <213> Vesicular stomatitis virus

<220>
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 <222> (1)..(1029)
 <223> "n" represents a, t, c, g, other or unknown

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<210> 14
 <211> 422
 <212> PRT
 <213> Vesicular stomatitis virus

<400> 14
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 Arg Lys Ser Lys Glu Ile Pro Leu Tyr Ile Asn Thr Thr Lys Ser Leu
 35 40 45
 Ser Asp Leu Arg Gly Tyr Val Tyr Gln Gly Leu Lys Ser Gly Asn Val
 50 55 60
 Ser Ile Ile His Val Asn Ser Tyr Leu Tyr Gly Ala Leu Lys Asp Ile
 65 70 75 80
 Arg Gly Lys Leu Asp Lys Asp Trp Ser Ser Phe Gly Ile Asn Ile Gly
 85 90 95
 Lys Ala Gly Asp Thr Ile Gly Ile Phe Asp Leu Val Ser Leu Lys Ala
 100 105 110
 Leu Asp Gly Val Leu Pro Asp Gly Val Ser Asp Ala Ser Arg Thr Ser
 115 120 125
 Ala Asp Asp Lys Trp Leu Pro Leu Tyr Leu Leu Gly Leu Tyr Arg Val
 130 135 140
 Gly Arg Thr Gln Met Pro Glu Tyr Arg Lys Lys Leu Met Asp Gly Leu
 145 150 155 160
 Thr Asn Gln Cys Lys Met Ile Asn Glu Gln Phe Glu Pro Leu Val Pro
 165 170 175
 Glu Gly Arg Asp Ile Phe Asp Val Trp Gly Asn Asp Ser Asn Tyr Thr
 180 185 190
 Lys Ile Val Ala Ala Val Asp Met Phe Phe His Met Phe Lys Lys His
 195 200 205
 Glu Cys Ala Ser Phe Arg Tyr Gly Thr Ile Val Ser Arg Phe Lys Asp
 210 215 220
 Cys Ala Ala Leu Ala Thr Phe Gly His Leu Cys Lys Ile Thr Gly Met
 225 230 235 240

Ser Thr Glu Asp Val Thr Thr Trp Ile Leu Asn Arg Glu Val Ala Asp
245 250 255

Glu Met Val Gln Met Met Leu Pro Gly Gln Glu Ile Asp Lys Ala Asp
260 265 270

Ser Tyr Met Pro Tyr Leu Ile Asp Phe Gly Leu Ser Ser Lys Ser Pro
275 280 285

Tyr Ser Ser Val Lys Asn Pro Ala Phe His Phe Trp Gly Gln Leu Thr
290 295 300

Ala Leu Leu Leu Arg Ser Thr Arg Ala Arg Asn Ala Arg Gln Pro Asp
305 310 315 320

Asp Ile Glu Tyr Thr Ser Leu Thr Thr Ala Gly Leu Leu Tyr Ala Tyr
325 330 335

Ala Val Gly Ser Ser Ala Asp Leu Ala Gln Gln Phe Cys Val Gly Asp
340 345 350

Asn Lys Tyr Thr Pro Asp Asp Ser Thr Gly Gly Leu Thr Thr Asn Ala
355 360 365

Pro Pro Gln Gly Arg Asp Val Val Glu Trp Leu Gly Trp Phe Glu Asp
370 375 380

Gln Asn Arg Lys Pro Thr Pro Asp Met Met Gln Tyr Ala Lys Arg Ala
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Val Met Ser Leu Gln Gly Leu Arg Glu Lys Thr Ile Gly Lys Tyr Ala
405 410 415

Lys Ser Glu Phe Asp Lys
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<210> 15

<211> 422

<212> PRT

<213> Vesicular stomatitis virus

<400> 15

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20 25 30

Arg Lys Ser Lys Glu Ile Pro Leu Tyr Ile Asn Thr Thr Lys Ser Leu
35 40 45

Ser Asp Leu Arg Gly Tyr Val Tyr Gln Gly Leu Lys Ser Gly Asn Val
50 55 60

Ser Ile Ile His Val Asn Ser Tyr Leu Tyr Gly Ala Leu Lys Asp Ile
65 70 75 80

Arg Gly Lys Leu Asp Lys Asp Trp Ser Ser Phe Gly Ile Asn Ile Gly 95
 85

Lys Ala Gly Asp Thr Ile Gly Ile Phe Asp Leu Val Ser Leu Lys Ala 110
 100 105

Leu Asp Gly Val Leu Pro Asp Gly Val Ser Asp Ala Ser Arg Thr Ser 125
 115 120

Ala Asp Asp Lys Trp Leu Pro Leu Tyr Leu Leu Gly Leu Tyr Arg Val 140
 130 135

Gly Arg Thr Gln Met Pro Glu Tyr Arg Lys Arg Leu Met Asp Gly Leu 160
 145 150 155

Thr Asn Gln Cys Lys Met Ile Asn Glu Gln Phe Glu Pro Leu Val Pro 175
 165 170

Glu Gly Arg Asp Ile Phe Asp Val Trp Gly Asn Asp Ser Asn Tyr Thr 190
 180 185

Lys Ile Val Ala Ala Val Asp Met Phe Phe His Met Phe Lys Lys His 205
 195 200

Glu Cys Ala Ser Phe Arg Tyr Gly Thr Ile Val Ser Arg Phe Lys Asp 220
 210 215

Cys Ala Ala Leu Ala Thr Phe Gly His Leu Cys Lys Ile Thr Gly Met 240
 225 230 235

Ser Thr Glu Asp Val Thr Thr Trp Ile Leu Asn Arg Glu Val Ala Asp 255
 245 250

Glu Met Val Gln Met Met Leu Pro Gly Gln Glu Ile Asp Lys Ala Asp 270
 260 265

Ser Tyr Met Pro Tyr Leu Ile Asp Phe Gly Leu Ser Ser Lys Ser Pro 285
 275 280

Tyr Ser Ser Val Lys Asn Pro Ala Phe His Phe Trp Gly Gln Leu Thr 300
 290 295

Ala Leu Leu Leu Arg Ser Thr Arg Ala Arg Asn Ala Arg Gln Pro Asp 320
 305 310 315

Asp Ile Glu Tyr Thr Ser Leu Thr Thr Ala Gly Leu Leu Tyr Ala Tyr 335
 325 330

Ala Val Gly Ser Ser Ala Asp Leu Ala Gln Gln Phe Cys Val Gly Asp 350
 340 345

Ser Lys Tyr Thr Pro Asp Asp Ser Thr Gly Gly Leu Thr Thr Asn Ala 365
 355 360

Pro Pro Gln Gly Arg Asp Val Val Glu Trp Leu Gly Trp Phe Glu Asp 380
 370 375

Gln Asn Arg Lys Pro Thr Pro Asp Met Met Gln Tyr Ala Lys Arg Ala
385 390 395 400

Val Met Ser Leu Gln Gly Leu Arg Glu Lys Thr Ile Gly Lys Tyr Ala
405 410 415

Lys Ser Glu Phe Asp Lys
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<210> 16

<211> 422

<212> PRT

<213> Vesicular stomatitis virus

<400> 16

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20 25 30

Arg Lys Ser Lys Glu Ile Pro Leu Tyr Ile Asn Thr Thr Lys Ser Leu
35 40 45

Ser Asp Leu Arg Gly Tyr Val Tyr Gln Gly Leu Lys Ser Gly Asn Val
50 55 60

Ser Ile Ile His Val Asn Ser Tyr Leu Tyr Gly Ala Leu Lys Asp Ile
65 70 75 80

Arg Gly Lys Leu Asp Lys Asp Trp Ser Ser Phe Gly Ile Asn Ile Gly
85 90 95

Lys Ala Gly Asp Thr Ile Gly Ile Phe Asp Leu Val Ser Leu Lys Ala
100 105 110

Leu Asp Gly Val Leu Pro Asp Gly Val Ser Asp Ala Ser Arg Thr Ser
115 120 125

Ala Asp Asp Lys Trp Leu Pro Leu Tyr Leu Leu Gly Leu Tyr Arg Val
130 135 140

Gly Arg Thr Gln Met Pro Glu Tyr Arg Lys Arg Leu Met Asp Gly Leu
145 150 155 160

Thr Asn Gln Cys Lys Met Ile Asn Glu Gln Phe Glu Pro Leu Val Pro
165 170 175

Glu Gly Arg Asp Ile Phe Asp Val Trp Gly Asn Asp Ser Asn Tyr Thr
180 185 190

Lys Ile Val Ala Ala Val Asp Met Phe Phe His Met Phe Lys Lys His
195 200 205

Glu Cys Ala Ser Phe Arg Tyr Gly Thr Ile Val Ser Arg Phe Lys Asp

210 215 220
 Cys Ala Ala Leu Ala Thr Phe Gly His Leu Cys Lys Ile Thr Gly Met
 225 230 235 240
 Ser Thr Glu Asp Val Thr Thr Trp Ile Leu Asn Arg Glu Val Ala Asp
 245 250 255
 Glu Met Val Gln Met Met Leu Pro Gly Gln Glu Ile Asp Lys Ala Asp
 260 265 270
 Ser Tyr Met Pro Tyr Leu Ile Asp Phe Gly Leu Ser Ser Lys Ser Pro
 275 280 285
 Tyr Ser Ser Val Lys Asn Pro Ala Phe His Phe Trp Gly Gln Leu Thr
 290 295 300
 Ala Leu Leu Leu Arg Ser Thr Arg Ala Arg Asn Ala Arg Gln Pro Asp
 305 310 315 320
 Asp Ile Glu Tyr Thr Ser Leu Thr Thr Ala Gly Leu Leu Tyr Ala Tyr
 325 330 335
 Ala Val Gly Ser Ser Ala Asp Leu Ala Gln Gln Phe Cys Val Gly Asp
 340 345 350
 Ser Lys Tyr Thr Pro Asp Asp Ser Thr Gly Gly Leu Thr Thr Asn Ala
 355 360 365
 Pro Pro Gln Gly Arg Asp Val Val Glu Trp Leu Gly Trp Phe Glu Asp
 370 375 380
 Gln Asn Arg Lys Pro Thr Pro Asp Met Met Gln Tyr Ala Lys Arg Ala
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 Val Met Ser Leu Gln Gly Leu Arg Glu Lys Thr Ile Gly Lys Tyr Ala
 405 410 415
 Lys Ser Glu Phe Asp Lys
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<210> 17
 <211> 342
 <212> PRT
 <213> Vesicular stomatitis virus

<220>
 <221> MOD_RES
 <222> (1)..(342)
 <223> "Xaa" represents any, other or unknown amino acid

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25

30

Lys Ala Gly Asp Thr Ile Gly Ile Phe Asp Leu Val Ser Leu Lys Ala
35 40 45

Leu Asp Gly Val Leu Pro Asp Gly Val Ser Asp Ala Ser Arg Thr Ser
50 55 60

Ala Asp Asp Lys Trp Leu Pro Leu Tyr Leu Leu Gly Leu Tyr Arg Val
65 70 75 80

Gly Arg Thr Gln Met Pro Glu Tyr Arg Lys Arg Leu Met Asp Gly Leu
85 90 95

Thr Asn Gln Cys Lys Met Ile Asn Glu Gln Phe Glu Pro Leu Val Pro
100 105 110

Glu Gly Arg Asp Ile Phe Asp Val Trp Gly Asn Asp Ser Asn Tyr Thr
115 120 125

Lys Ile Val Ala Ala Val Asp Met Phe Phe His Met Phe Lys Lys His
130 135 140

Glu Cys Ala Ser Phe Arg Tyr Gly Thr Ile Val Ser Arg Phe Lys Asp
145 150 155 160

Cys Ala Ala Leu Ala Thr Phe Gly His Leu Cys Lys Ile Thr Gly Met
165 170 175

Ser Thr Glu Asp Val Thr Thr Trp Ile Leu Asn Arg Glu Val Ala Asp
180 185 190

Glu Met Val Gln Met Met Leu Pro Gly Gln Glu Ile Asp Lys Ala Asp
195 200 205

Ser Tyr Met Pro Tyr Leu Ile Asp Phe Gly Leu Ser Ser Lys Ser Pro
210 215 220

Tyr Ser Ser Val Lys Asn Pro Ala Phe His Phe Trp Gly Gln Leu Thr
225 230 235 240

Asp Ile Glu Tyr Thr Ser Xaa Thr Thr Ala Gly Leu Leu Tyr Ala Tyr
245 250 255

Ala Val Gly Ser Ser Ala Asp Leu Ala Xaa Gln Phe Cys Val Gly Asp
260 265 270

Ser Lys Tyr Thr Pro Asp Asp Ser Thr Gly Gly Leu Thr Thr Asn Ala
275 280 285

Pro Pro Gln Gly Arg Asp Val Val Glu Trp Leu Gly Trp Phe Glu Asp
290 295 300

Gln Asn Arg Lys Pro Thr Pro Asp Met Met Gln Tyr Ala Lys Arg Ala
305 310 315 320

Val Met Ser Leu Gln Gly Leu Arg Glu Lys Thr Ile Gly Lys Tyr Ala

Lys Ser Glu Phe Asp Lys
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<210> 18

<211> 798

<212> DNA

<213> Vesicular stomatitis virus

<400> 18

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<210> 19

<211> 798

<212> DNA

<213> Vesicular stomatitis virus

<400> 19

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caagaggacg gagtggaga gcatactagg cctcttatt ttcaggcagc agatgattct 180
gacacagaat ctgaaccaga aattgaagac aatcaaggct tgtatgtacc agatccggaa 240
gctgagcaag ttgaaggctt tatacagggg cctttagatg actatgcgga tgaggacgtg 300
gatgttgtat tcacttcgga ctggaaacag cctgagcttg aatccgacga gcatggaaaag 360
accttacggt tgacattgcc agagggttta agtggagagc agaaatccca gtggcttttg 420
acgattaaag cagtcgttca aagtgccaaa cactggaatc tggcagagtg cacatttgaa 480
gcatcgggag aaggggtcat cataaaaaag cgccagataa ctccggatgt atataaggtc 540
actccagtga tgaacacaca tccgtcccaa tcagaagccg tatcagatgt ttggtctctc 600
tcaaagacat ccatgacttt ccaacccaag aaagcaagtc ttcagcctct caccatatcc 660
ttggatgaat tgttctcatc tagaggagaa ttcatctctg tcggagggtaa cggacgaatg 720
tctcataaag aggccatcct gctcggcctg aggtacaaaa agttgtacaa tcaggcgaga 780
gtcaaatatt ctctgtag 798

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<210> 20

<211> 570

<212> DNA

<213> Vesicular stomatitis virus

<400> 20

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atggataatc tcacaaaagt tcgtgagtat ctcaagtcct attctcgtct agatcaggcg 60

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gtaggagaga tagatgagat cgaagcacaa cgagctgaaa agtccaatta tgagttgttc 120
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 gacacagaat ctgaaccaga aattgaagac aatcaaggct tgtatgtacc agatccggaa 240
 gctgagcaag ttgaaggctt tatacagggg ccttttagatg actatgcgga tgaggacgtg 300
 gatgttgtat tcacttcgga ctggaaacag cctgagcttg aatccgacga gcatggaaag 360
 accttacggg tgacattgcc agaggggttta agtggagagc agaaatccca gtggcttttg 420
 acgattaaag cagtcgttca aagtgccaaa cactggaatc tggcagagtg cacatttgaa 480
 gcatcgggag aaggggtcat cataaaaaag cgccagataa ctccggatgt atataaggtc 540
 actccagtga tgaacacaca tccgtcccaa 570

<210> 21
 <211> 798
 <212> DNA
 <213> Vesicular stomatitis virus

<400> 21
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 gtaggagaga tagatgagat cgaagcacaa cgagctgaaa agtccaatta tgagttgttc 120
 caagaggacg gagtggaaga gcatactagg ccctcttatt ttcaggcagc agatgattct 180
 gacacagaat ctgaaccaga aattgaagac aatcaaggct tgtatgtacc agatccggaa 240
 gctgagcaag ttgaaggctt tatacagggg ccttttagatg actatgcgga tgaggacgtg 300
 gatgttgtat tcacttcgga ctggaaacag cctgagcttg aatccgacga gcatggaaag 360
 accttacggg tgacattgcc agaggggttta agtggagagc agaaatccca gtggcttttg 420
 acgattaaag cagtcgttca aagtgccaaa cactggaatc tggcagagtg cacatttgaa 480
 gcatcgggag aaggggtcat cataaaaaag cgccagataa ctccggatgt atataaggtc 540
 actccagtga tgaacacaca tccgtcccaa tcggaagccg tatcagatgt ttggtctctc 600
 tcaaagacat ccatgacttt ccaacccaag aaagcaagtc ttcagcctct caccatatcc 660
 ttggatgaat tgttctcctc tagaggagaa ttcattctctg tcggaggtaa cggacgaatg 720
 tctcataaag aggccatcct gctcgggtctg aggtacaaaa agttgtacaa tcaggcgaga 780
 gtcaaatatt ctctgtag 798

<210> 22
 <211> 798
 <212> DNA
 <213> Vesicular stomatitis virus

<400> 22
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 gtaggagaga tagatgagat cgaagcacaa cgagctgaaa agtccaatta tgagttgttc 120
 caagaggacg gagtggaaga gcatactagg ccctcttatt ttcaggcagc agatgattct 180
 gacacagaat ctgaaccaga aattgaagac aatcaaggct tgtatgtacc agatccggaa 240
 gctgagcaag ttgaaggctt tatacagggg ccttttagatg actatgcgga tgaggacgtg 300
 gatgttgtat tcacttcgga ctggaaacag cctgagcttg aatccgacga gcatggaaag 360
 accttacggg tgacattgcc agaggggttta agtggagagc agaaatccca gtggcttttg 420
 acgattaaag cagtcgttca aagtgccaaa cactggaatc tggcagagtg cacatttgaa 480
 gcatcgggag aaggggtcat cataaaaaag cgccagataa ctccggatgt atataaggtc 540
 actccagtga tgaacacaca tccgtcccaa tcagaagccg tatcagatgt ttggtctctc 600
 tcaaagacat ccatgacttt ccaacccaag aaagcaagtc ttcagcctct caccatatcc 660
 ttggatgaat tgttctcctc tagaggagaa ttcattctctg tcggaggtaa cggacgaatg 720
 tctcataaag aggccatcct gctcgggtctg aggtacaaaa agttgtacaa tcaggcgaga 780
 gtcaaatatt ctctgtag 798

<210> 23
 <211> 265

<212> PRT

<213> Vesicular stomatitis virus

<400> 23

Met Asp Asn Leu Thr Lys Val Arg Glu Tyr Leu Lys Ser Tyr Ser Arg
1 5 10 15

Leu Asp Gln Ala Val Gly Glu Ile Asp Glu Ile Glu Ala Gln Arg Ala
20 25 30

Glu Lys Ser Asn Tyr Glu Leu Phe Gln Glu Asp Gly Val Glu Glu His
35 40 45

Thr Lys Pro Ser Tyr Phe Gln Ala Ala Asp Asp Ser Asp Thr Glu Ser
50 55 60

Glu Pro Glu Ile Glu Asp Asn Gln Gly Leu Tyr Ala Gln Asp Pro Glu
65 70 75 80

Ala Glu Gln Val Glu Gly Phe Ile Gln Gly Pro Leu Asp Asp Tyr Ala
85 90 95

Asp Glu Glu Val Asp Val Val Phe Thr Ser Asp Trp Lys Pro Pro Glu
100 105 110

Leu Glu Ser Asp Glu His Gly Lys Thr Leu Arg Leu Thr Ser Pro Glu
115 120 125

Gly Leu Ser Gly Glu Gln Lys Ser Gln Trp Leu Ser Thr Ile Lys Ala
130 135 140

Val Val Gln Ser Ala Lys Tyr Trp Asn Leu Ala Glu Cys Thr Phe Glu
145 150 155 160

Ala Ser Gly Glu Gly Val Ile Met Lys Glu Arg Gln Ile Thr Pro Asp
165 170 175

Val Tyr Lys Val Thr Pro Val Met Asn Thr His Pro Ser Gln Ser Glu
180 185 190

Ala Val Ser Asp Val Trp Ser Leu Ser Lys Thr Ser Met Thr Phe Gln
195 200 205

Pro Lys Lys Ala Ser Leu Gln Pro Leu Thr Ile Ser Leu Asp Glu Leu
210 215 220

Phe Ser Ser Arg Gly Glu Phe Ile Ser Val Gly Gly Asp Gly Arg Met
225 230 235 240

Ser His Lys Glu Ala Ile Leu Leu Gly Leu Arg Tyr Lys Lys Leu Tyr
245 250 255

Asn Gln Ala Arg Val Lys Tyr Ser Leu
260 265

<210> 24

<211> 265
<212> PRT
<213> Vesicular stomatitis virus

<400> 24

Met Asp Asn Leu Thr Lys Val Arg Glu Tyr Leu Lys Ser Tyr Ser Arg
1 5 10 15

Leu Asp Gln Ala Val Gly Glu Ile Asp Glu Ile Glu Ala Gln Arg Ala
20 25 30

Glu Lys Ser Asn Tyr Glu Leu Phe Gln Glu Asp Gly Val Glu Glu His
35 40 45

Thr Arg Pro Ser Tyr Phe Gln Ala Ala Asp Asp Ser Asp Thr Glu Ser
50 55 60

Glu Pro Glu Ile Glu Asp Asn Gln Gly Leu Tyr Val Pro Asp Pro Glu
65 70 75 80

Ala Glu Gln Val Glu Gly Phe Ile Gln Gly Pro Leu Asp Asp Tyr Ala
85 90 95

Asp Glu Asp Val Asp Val Val Phe Thr Ser Asp Trp Lys Gln Pro Glu
100 105 110

Leu Glu Ser Asp Glu His Gly Lys Thr Leu Arg Leu Thr Leu Pro Glu
115 120 125

Gly Leu Ser Gly Glu Gln Lys Ser Gln Trp Leu Leu Thr Ile Lys Ala
130 135 140

Val Val Gln Ser Ala Lys His Trp Asn Leu Ala Glu Cys Thr Phe Glu
145 150 155 160

Ala Ser Gly Glu Gly Val Ile Ile Lys Lys Arg Gln Ile Thr Pro Asp
165 170 175

Val Tyr Lys Val Thr Pro Val Met Asn Thr His Pro Ser Gln Ser Glu
180 185 190

Ala Val Ser Asp Val Trp Ser Leu Ser Lys Thr Ser Met Thr Phe Gln
195 200 205

Pro Lys Lys Ala Ser Leu Gln Pro Leu Thr Ile Ser Leu Asp Glu Leu
210 215 220

Phe Ser Ser Arg Gly Glu Phe Ile Ser Val Gly Gly Asn Gly Arg Met
225 230 235 240

Ser His Lys Glu Ala Ile Leu Leu Gly Leu Arg Tyr Lys Lys Leu Tyr
245 250 255

Asn Gln Ala Arg Val Lys Tyr Ser Leu
260 265

<210> 25
<211> 190
<212> PRT
<213> Vesicular stomatitis virus

<400> 25
Met Asp Asn Leu Thr Lys Val Arg Glu Tyr Leu Lys Ser Tyr Ser Arg
1 5 10 15
Leu Asp Gln Ala Val Gly Glu Ile Asp Glu Ile Glu Ala Gln Arg Ala
20 25 30
Glu Lys Ser Asn Tyr Glu Leu Phe Gln Glu Asp Gly Val Glu Glu His
35 40 45
Thr Arg Pro Ser Tyr Phe Gln Ala Ala Asp Asp Ser Asp Thr Glu Ser
50 55 60
Glu Pro Glu Ile Glu Asp Asn Gln Gly Leu Tyr Val Pro Asp Pro Glu
65 70 75 80
Ala Glu Gln Val Glu Gly Phe Ile Gln Gly Pro Leu Asp Asp Tyr Ala
85 90 95
Asp Glu Asp Val Asp Val Val Phe Thr Ser Asp Trp Lys Gln Pro Glu
100 105 110
Leu Glu Ser Asp Glu His Gly Lys Thr Leu Arg Leu Thr Leu Pro Glu
115 120 125
Gly Leu Ser Gly Glu Gln Lys Ser Gln Trp Leu Leu Thr Ile Lys Ala
130 135 140
Val Val Gln Ser Ala Lys His Trp Asn Leu Ala Glu Cys Thr Phe Glu
145 150 155 160
Ala Ser Gly Glu Gly Val Ile Ile Lys Lys Arg Gln Ile Thr Pro Asp
165 170 175
Val Tyr Lys Val Thr Pro Val Met Asn Thr His Pro Ser Gln
180 185 190

<210> 26
<211> 265
<212> PRT
<213> Vesicular stomatitis virus

<400> 26
Met Asp Asn Leu Thr Lys Val Arg Glu Tyr Leu Lys Ser Tyr Ser Arg
1 5 10 15
Leu Asp Gln Ala Val Gly Glu Ile Asp Glu Ile Glu Ala Gln Arg Ala
20 25 30
Glu Lys Ser Asn Tyr Glu Leu Phe Gln Glu Asp Gly Val Glu Glu His
35 40 45

Thr Arg Pro Ser Tyr Phe Gln Ala Ala Asp Asp Ser Asp Thr Glu Ser
50 55 60

Glu Pro Glu Ile Glu Asp Asn Gln Gly Leu Tyr Val Pro Asp Pro Glu
65 70 75 80

Ala Glu Gln Val Glu Gly Phe Ile Gln Gly Pro Leu Asp Asp Tyr Ala
85 90 95

Asp Glu Asp Val Asp Val Val Phe Thr Ser Asp Trp Lys Gln Pro Glu
100 105 110

Leu Glu Ser Asp Glu His Gly Lys Thr Leu Arg Leu Thr Leu Pro Glu
115 120 125

Gly Leu Ser Gly Glu Gln Lys Ser Gln Trp Leu Leu Thr Ile Lys Ala
130 135 140

Val Val Gln Ser Ala Lys His Trp Asn Leu Ala Glu Cys Thr Phe Glu
145 150 155 160

Ala Ser Gly Glu Gly Val Ile Ile Lys Lys Arg Gln Ile Thr Pro Asp
165 170 175

Val Tyr Lys Val Thr Pro Val Met Asn Thr His Pro Ser Gln Ser Glu
180 185 190

Ala Val Ser Asp Val Trp Ser Leu Ser Lys Thr Ser Met Thr Phe Gln
195 200 205

Pro Lys Lys Ala Ser Leu Gln Pro Leu Thr Ile Ser Leu Asp Glu Leu
210 215 220

Phe Ser Ser Arg Gly Glu Phe Ile Ser Val Gly Gly Asn Gly Arg Met
225 230 235 240

Ser His Lys Glu Ala Ile Leu Leu Gly Leu Arg Tyr Lys Lys Leu Tyr
245 250 255

Asn Gln Ala Arg Val Lys Tyr Ser Leu
260 265

<210> 27

<211> 265

<212> PRT

<213> Vesicular stomatitis virus

<400> 27

Met Asp Asn Leu Thr Lys Val Arg Glu Tyr Leu Lys Ser Tyr Ser Arg
1 5 10 15

Leu Asp Gln Ala Val Gly Glu Ile Asp Glu Ile Glu Ala Gln Arg Ala
20 25 30

Glu Lys Ser Asn Tyr Glu Leu Phe Gln Glu Asp Gly Val Glu Glu His

35

40

45

Thr Arg Pro Ser Tyr Phe Gln Ala Ala Asp Asp Ser Asp Thr Glu Ser
50 55 60

Glu Pro Glu Ile Glu Asp Asn Gln Gly Leu Tyr Val Pro Asp Pro Glu
65 70 75 80

Ala Glu Gln Val Glu Gly Phe Ile Gln Gly Pro Leu Asp Asp Tyr Ala
85 90 95

Asp Glu Asp Val Asp Val Val Phe Thr Ser Asp Trp Lys Gln Pro Glu
100 105 110

Leu Glu Ser Asp Glu His Gly Lys Thr Leu Arg Leu Thr Leu Pro Glu
115 120 125

Gly Leu Ser Gly Glu Gln Lys Ser Gln Trp Leu Leu Thr Ile Lys Ala
130 135 140

Val Val Gln Ser Ala Lys His Trp Asn Leu Ala Glu Cys Thr Phe Glu
145 150 155 160

Ala Ser Gly Glu Gly Val Ile Ile Lys Lys Arg Gln Ile Thr Pro Asp
165 170 175

Val Tyr Lys Val Thr Pro Val Met Asn Thr His Pro Ser Gln Ser Glu
180 185 190

Ala Val Ser Asp Val Trp Ser Leu Ser Lys Thr Ser Met Thr Phe Gln
195 200 205

Pro Lys Lys Ala Ser Leu Gln Pro Leu Thr Ile Ser Leu Asp Glu Leu
210 215 220

Phe Ser Ser Arg Gly Glu Phe Ile Ser Val Gly Gly Asn Gly Arg Met
225 230 235 240

Ser His Lys Glu Ala Ile Leu Leu Gly Leu Arg Tyr Lys Lys Leu Tyr
245 250 255

Asn Gln Ala Arg Val Lys Tyr Ser Leu
260 265

<210> 28

<211> 690

<212> DNA

<213> Vesicular stomatitis virus

<400> 28

atgagttcct taaagaagat tctcgggtctg aaggggaaag gtaagaaatc taagaaatta 60
gggatcgac cacccttta tgaagaggac actagcatgg agtatgctcc gagcgctcca 120
attgacaaat cctatttttg agttgacgag atggacacct atgatccgaa tcaattaaga 180
tatgagaaat tcttctttac agtgaaaatg acggtttagat ctaatcgctc gttcagaaca 240
tactcagatg tggcagccgc tgtatcccat tgggatacaca tgtacatcgg aatggcaggg 300
aaacgtccct tctacaaaat cttggctttt ttgggttctt ctaatctaaa ggccactcca 360

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gcggtatttg cagatcaagg tcaaccagag tatcacactc actgcgaagg cagggcttat 420
ttgccacata ggatggggaa gaccctccc atgctcaatg taccagagca cttcagaaga 480
ccattcaata taggtcttta caagggaacg attgagctca caatgaccat ctacgatgat 540
gagtcactgg aagcagctcc tatgatctgg gatcatttca attcttccaa attttctgat 600
ttcagagaga aggccttaat gtttggcctg attgtcgaga aaaaggcatc tggagcgtgg 660
gtcctggatt ctatcagcca cttcaaata 690

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<210> 29

<211> 690

<212> DNA

<213> Vesicular stomatitis virus

<400> 29

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atgagttcct taaagaagat tctcggctcg aaggggaaag gtaagaaatc taagaaatta 60
gggatcgcac caccctctta tgaagaggac actaacatgg agtatgctcc gagcgctcca 120
attgacaaat cctatttttg agttgacgag atggacactc atgatccgca tcaattaaga 180
tatgagaaat tcttctttac agtgaaaatg acggttagat ctaatcgtcc gttcagaaca 240
tactcagatg tggcagccgc tgtatcccat tgggatcaca tgtacatcgg aatggcaggg 300
aaacgtccct tctacaagat cttggctttt ttgggttctt ctaatctaaa ggccactcca 360
gcggtatttg cagatcaagg tcaaccagag tatcacgctc actgtgaagg cagggcttat 420
ttgccacaca gaatggggaa gaccctccc atgctcaatg taccagagca cttcagaaga 480
ccattcaata taggtcttta caagggaacg gttgagctca caatgaccat ctacgatgat 540
gagtcactgg aagcagctcc tatgatctgg gatcatttca attcttccaa attttctgat 600
ttcagagaga aggccttaat gtttggcctg attgtcgaga aaaaggcatc tggagcgtgg 660
gtcctggatt ctgtcagcca cttcaaata 690

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<210> 30

<211> 690

<212> DNA

<213> Vesicular stomatitis virus

<400> 30

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atgagttcct taaagaagat tctcggctcg aaggggaaag gtaagaaatc taagaaatta 60
gggatcgcac caccctctta tgaagaggac actaacatgg agtatgctcc gagcgctcca 120
attgacaaat cctatttttg agttgacgag agggacactc atgatccgca tcaattaaga 180
tatgagaaat tcttctttac agtgaaaatg acggttagat ctaatcgtcc gttcagaaca 240
tactcagatg tggcagccgc tgtatcccat tgggatcaca tgtacatcgg aatggcaggg 300
aaacgtccct tctacaagat cttggctttt ttgggttctt ctaatctaaa ggccactcca 360
gcggtatttg cagatcaagg tcaaccagag tatcacgctc actgtgaagg cagggcttat 420
ttgccacaca gaatggggaa gaccctccc atgctcaatg taccagagca cttcagaaga 480
ccattcaata taggtcttta caagggaacg gttgagctca caatgaccat ctacgatgat 540
gagtcactgg aagcagctcc tatgatctgg gatcatttca attcttccaa attttctgat 600
ttcagagaga aggccttaat gtttggcctg attgtcgaga aaaaggcatc tggagcgtgg 660
gtcctggatt ctgtcagcca cttcaaata 690

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<210> 31

<211> 690

<212> DNA

<213> Vesicular stomatitis virus

<400> 31

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atgagttcct taaagaagat tctcggctcg aaggggaaag gtaagaaatc taagaaatta 60
gggatcgcac caccctctta tgaagaggac actaacatgg agtatgctcc gagcgctcca 120
attgacaaat cctatttttg agttgacgag atggacactc atgatccgca tcaattaaga 180

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tatgagaaat tcttctttac agtgaaaatg acgggtagat ctaatcgtcc gttcagaaca 240
tactcagatg tggcagccgc tgtatcccat tgggatcaca tgtacatcgg aatggcaggg 300
aaacgtccct tctacaagat cttggctttt ttgggttctt ctaatctaaa ggccactcca 360
gcggtattgg cagatcaagg tcaaccagag tatcacgctc actgtgaagg cagggcttat 420
ttgccacaca gaatggggaa gacccctccc atgctcaatg taccagagca cttcagaaga 480
ccattcaata taggtcttta caagggaacg gttgagctca caatgacat ctacgatgat 540
gagtcactgg aagcagctcc tatgatctgg gatcatttca attcttccaa attttctgat 600
ttcagagaga aggccttaat gtttggcctg attgtcgaga aaaaggcatc tggagcttgg 660
gtcctggatt ctgtcagcca cttcaaatga 690

<210> 32

<211> 229

<212> PRT

<213> Vesicular stomatitis virus

<400> 32

Met Ser Ser Leu Lys Lys Ile Leu Gly Leu Lys Gly Lys Gly Lys Lys
1 5 10 15

Ser Lys Lys Leu Gly Ile Ala Pro Pro Pro Tyr Glu Glu Asp Thr Ser
20 25 30

Met Glu Tyr Ala Pro Ser Ala Pro Ile Asp Lys Ser Tyr Phe Gly Val
35 40 45

Asp Glu Met Asp Thr Tyr Asp Pro Asn Gln Leu Arg Tyr Glu Lys Phe
50 55 60

Phe Phe Thr Val Lys Met Thr Val Arg Ser Asn Arg Pro Phe Arg Thr
65 70 75 80

Tyr Ser Asp Val Ala Ala Ala Val Ser His Trp Asp His Met Tyr Ile
85 90 95

Gly Met Ala Gly Lys Arg Pro Phe Tyr Lys Ile Leu Ala Phe Leu Gly
100 105 110

Ser Ser Asn Leu Lys Ala Thr Pro Ala Val Leu Ala Asp Gln Gly Gln
115 120 125

Pro Glu Tyr His Thr His Cys Glu Gly Arg Ala Tyr Leu Pro His Arg
130 135 140

Met Gly Lys Thr Pro Pro Met Leu Asn Val Pro Glu His Phe Arg Arg
145 150 155 160

Pro Phe Asn Ile Gly Leu Tyr Lys Gly Thr Ile Glu Leu Thr Met Thr
165 170 175

Ile Tyr Asp Asp Glu Ser Leu Glu Ala Ala Pro Met Ile Trp Asp His
180 185 190

Phe Asn Ser Ser Lys Phe Ser Asp Phe Arg Glu Lys Ala Leu Met Phe
195 200 205

Gly Leu Ile Val Glu Lys Lys Ala Ser Gly Ala Trp Val Leu Asp Ser

210

215

220

Ile Ser His Phe Lys
225

<210> 33

<211> 229

<212> PRT

<213> Vesicular stomatitis virus

<400> 33

Met Ser Ser Leu Lys Lys Ile Leu Gly Leu Lys Gly Lys Gly Lys Lys
1 5 10 15

Ser Lys Lys Leu Gly Ile Ala Pro Pro Tyr Glu Glu Asp Thr Asn
20 25 30

Met Glu Tyr Ala Pro Ser Ala Pro Ile Asp Lys Ser Tyr Phe Gly Val
35 40 45

Asp Glu Met Asp Thr His Asp Pro His Gln Leu Arg Tyr Glu Lys Phe
50 55 60

Phe Phe Thr Val Lys Met Thr Val Arg Ser Asn Arg Pro Phe Arg Thr
65 70 75 80

Tyr Ser Asp Val Ala Ala Ala Val Ser His Trp Asp His Met Tyr Ile
85 90 95

Gly Met Ala Gly Lys Arg Pro Phe Tyr Lys Ile Leu Ala Phe Leu Gly
100 105 110

Ser Ser Asn Leu Lys Ala Thr Pro Ala Val Leu Ala Asp Gln Gly Gln
115 120 125

Pro Glu Tyr His Ala His Cys Glu Gly Arg Ala Tyr Leu Pro His Arg
130 135 140

Met Gly Lys Thr Pro Pro Met Leu Asn Val Pro Glu His Phe Arg Arg
145 150 155 160

Pro Phe Asn Ile Gly Leu Tyr Lys Gly Thr Val Glu Leu Thr Met Thr
165 170 175

Ile Tyr Asp Asp Glu Ser Leu Glu Ala Ala Pro Met Ile Trp Asp His
180 185 190

Phe Asn Ser Ser Lys Phe Ser Asp Phe Arg Glu Lys Ala Leu Met Phe
195 200 205

Gly Leu Ile Val Glu Lys Lys Ala Ser Gly Ala Trp Val Leu Asp Ser
210 215 220

Val Ser His Phe Lys
225

<210> 34
<211> 229
<212> PRT
<213> Vesicular stomatitis virus

<400> 34
Met Ser Ser Leu Lys Lys Ile Leu Gly Leu Lys Gly Lys Gly Lys Lys
1 5 10 15
Ser Lys Lys Leu Gly Ile Ala Pro Pro Pro Tyr Glu Glu Asp Thr Asn
20 25 30
Met Glu Tyr Ala Pro Ser Ala Pro Ile Asp Lys Ser Tyr Phe Gly Val
35 40 45
Asp Glu Met Asp Thr His Asp Pro His Gln Leu Arg Tyr Glu Lys Phe
50 55 60
Phe Phe Thr Val Lys Met Thr Val Arg Ser Asn Arg Pro Phe Arg Thr
65 70 75 80
Tyr Ser Asp Val Ala Ala Ala Val Ser His Trp Asp His Met Tyr Ile
85 90 95
Gly Met Ala Gly Lys Arg Pro Phe Tyr Lys Ile Leu Ala Phe Leu Gly
100 105 110
Ser Ser Asn Leu Lys Ala Thr Pro Ala Val Leu Ala Asp Gln Gly Gln
115 120 125
Pro Glu Tyr His Ala His Cys Glu Gly Arg Ala Tyr Leu Pro His Arg
130 135 140
Met Gly Lys Thr Pro Pro Met Leu Asn Val Pro Glu His Phe Arg Arg
145 150 155 160
Pro Phe Asn Ile Gly Leu Tyr Lys Gly Thr Val Glu Leu Thr Met Thr
165 170 175
Ile Tyr Asp Asp Glu Ser Leu Glu Ala Ala Pro Met Ile Trp Asp His
180 185 190
Phe Asn Ser Ser Lys Phe Ser Asp Phe Arg Glu Lys Ala Leu Met Phe
195 200 205
Gly Leu Ile Val Glu Lys Lys Ala Ser Gly Ala Trp Val Leu Asp Ser
210 215 220
Val Ser His Phe Lys
225

<210> 35
<211> 229
<212> PRT
<213> Vesicular stomatitis virus

<400> 35

Met Ser Ser Leu Lys Lys Ile Leu Gly Leu Lys Gly Lys Gly Lys Lys
1 5 10 15

Ser Lys Lys Leu Gly Ile Ala Pro Pro Pro Tyr Glu Glu Asp Thr Asn
20 25 30

Met Glu Tyr Ala Pro Ser Ala Pro Ile Asp Lys Ser Tyr Phe Gly Val
35 40 45

Asp Glu Arg Asp Thr His Asp Pro His Gln Leu Arg Tyr Glu Lys Phe
50 55 60

Phe Phe Thr Val Lys Met Thr Val Arg Ser Asn Arg Pro Phe Arg Thr
65 70 75 80

Tyr Ser Asp Val Ala Ala Ala Val Ser His Trp Asp His Met Tyr Ile
85 90 95

Gly Met Ala Gly Lys Arg Pro Phe Tyr Lys Ile Leu Ala Phe Leu Gly
100 105 110

Ser Ser Asn Leu Lys Ala Thr Pro Ala Val Leu Ala Asp Gln Gly Gln
115 120 125

Pro Glu Tyr His Ala His Cys Glu Gly Arg Ala Tyr Leu Pro His Arg
130 135 140

Met Gly Lys Thr Pro Pro Met Leu Asn Val Pro Glu His Phe Arg Arg
145 150 155 160

Pro Phe Asn Ile Gly Leu Tyr Lys Gly Thr Val Glu Leu Thr Met Thr
165 170 175

Ile Tyr Asp Asp Glu Ser Leu Glu Ala Ala Pro Met Ile Trp Asp His
180 185 190

Phe Asn Ser Ser Lys Phe Ser Asp Phe Arg Glu Lys Ala Leu Met Phe
195 200 205

Gly Leu Ile Val Glu Lys Lys Ala Ser Gly Ala Trp Val Leu Asp Ser
210 215 220

Val Ser His Phe Lys
225

<210> 36

<211> 1536

<212> DNA

<213> Vesicular stomatitis virus

<400> 36

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gtttttccac acaaccaaaa aggaactgg aaaaatgttc cttctaatta ccattattgc 120
ccgtcaagct cagatttaaa ttggcataat gacttaatag gcacagccat acaagtcaaa 180

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atgcccaaga gtcacaaggc tattcaagca gacggttggg tgtgtcatgc ttccaaatgg 240
gtcactactt gtgatttccg ctggtatgga ccgaagtata taacacagtc catccgatcc 300
ttcactccat ctgtagaaca atgcaaggaa agcattgaac aaacgaaaca aggaacttgg 360
ctgaatccag gcttccctcc tcaaagttgt ggatatgcaa ctgtgacgga tgccgaagca 420
gtgattgtcc aggtgactcc tcaccatgtg ctggttgatg aatacacagg agaatgggtt 480
gattcacagt tcatcaacgg aaaatgcagc aattacatat gccccactgt ccataactct 540
acaacctggc attctgacta taaggtcaaa gggctatgtg attctaacct catttccatg 600
gacatcacct tcttctcaga ggacggagag ctatcatccc tgggaaagga gggcacaggg 660
ttcagaagta actactttgc ttatgaaact ggaggcaagg cctgcaaaat gcaatactgc 720
aagcattggg gagtcagact cccatcaggt gtctggttcg agatggctga taaggatctc 780
tttgctgcag ccagattccc tgaatgccc gaaggggtcaa gtatctctgc tccatctcag 840
acctcagtgg atgtaagtct aattcaggac gttgagagga tcttggatta ttccctctgc 900
caagaaacct ggagcaaaat cagagcgggt cttccaatct ctccagtgga tctcagctat 960
cttgctccta aaaaccagg aaccgggtcct gctttcacca taatcaatgg taccctaaaa 1020
tactttgaga ccagatacat cagagtcgat attgctgctc caatcctctc aagaatgggtc 1080
ggaatgatca gtggaactac cacagaaagg gaactgtggg atgactgggc accatatgaa 1140
gacgtggaaa ttggacccaa tggagttctg aggaccagtt caggatataa gtttccttta 1200
tacatgattg gacatggtat gttggactcc gatcttcatc ttagtcaaaa ggctcagggtg 1260
ttcgaacatc ctcacattca agacgctgct tcgcaacttc ctgatgatga gagtttattt 1320
tttgggtgata ctgggctatc caaaaatcca atcgagcttg tagaagggtt gttcagtagt 1380
tggaagagct ctattgcctc ttttttcttt atcatagggg taatcattgg actattcttg 1440
gttctccgag ttggtatcca tctttgcatt aaattaaagc acaccaagaa aagacagatt 1500
tatacagaca tagagatgaa ccgacttggg aagtaa 1536

```

<210> 37

<211> 885

<212> DNA

<213> Vesicular stomatitis virus

<220>

<221> modified_base

<222> (1)..(885)

<223> "n" represents a, t, c, g, other or unknown

<400> 37

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atgaagtgcc ttttgkactt agctttttta ttcacgggg tgaattgcaa gttcaccata 60
gtttttccat acaacccaaa aggaaactgg aaaaatgttc cttccaatta ccattattgc 120
ccgtcaagct cagattttaa ttgncataat gacttaatag gcacagcctt acaagtcaaa 180
atgcccaaga gtcacaaggc tattcaagca gacggttggg tgtgtcatgc ttccaaatgg 240
gtcactactt gtgatttccg ctggtacgga ccgaagtata taacacattc catccgatcc 300
ttcactccat ctgtagaaca atgcaaggaa agcattgaac aaacgaaaca aggaacttgg 360
ctgaatccag gcttccctcc tcaaagttgt ggatatgcaa ctgtgacgga tgctgaagca 420
gcgattgtcc aggtgactcc tcaccatgtg cttgttgatg aatacacagg agaatgggtt 480
gattcacagt tcatcaacgg aaaatgcagc aatgacatat gccccactgt ccataactcc 540
acaacctggc attccgacta taaggtcaaa gggctatgtg attctaacct catttccatg 600
gacatcacct tcttctcaga ggacggagag ctatcatccc taggaaagga gggcacaggg 660
ttcagaagta actactttgc ttatgaaact ggagacaagg cctgcaaaat gcagtactgc 720
aagcgttggg gagtcagact cccatcaggt gtctggttcg agatggctga taaggatctc 780
tttgctgcag ccagattccc tgaatgccc gaaggggtcaa gtatctctgc tccatctcag 840
acctcagtgg atgtaagtct cattcaggac gttgagagga tcttg 885

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<210> 38

<211> 705

<212> DNA

<213> Vesicular stomatitis virus

<400> 38

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ccatctcaga cctcagtgga tgtaagtctc attcaggacg ttgagaggat cttggattat 60
tccctctgcc aagaaacctg gagcaaaatc agagcgggtc ttcccatctc tccagtggat 120
ctcagctatc ttgctcctaa aaaccaggga accggtcctg tctttaccat aatcaatggg 180
accctaaaat actttgagac cagatacatc agagtcgata ttgctgctcc aatcctctca 240
agaatggtcg gaatgatcag tggaaactacc acagaaaggg aactgtggga tgactgggct 300
ccatatgaag acgtggaaat tggaccaat ggagttctga ggaccagttc aggatataag 360
tttcctttat atatgattgg acatgggatg ttggactccg atcttcatct tagctcaaag 420
gctcaggtgt ttgaacatcc tcacattcaa gacgctgctt cgcagcttcc tgatgatgag 480
actttatttt ttggtgatac tgggctatcc aaaaatccaa tcgagtttgt agaaggttgg 540
ttcagtagtt ggaagagctc tattgcctct tttttcttta tcatagggtt aatcattgga 600
ctattcttgg ttctccgagt tggatattat ctttgcatta aattaaagca caccaagaaa 660
agacagattt atacagacat agagatgaac cgacttggga agtaa 705
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<210> 39

<211> 1536

<212> DNA

<213> Vesicular stomatitis virus

<400> 39

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atgaagtgcc ttttgtactt agctttttta ttcacgggg tgaattgcaa gttcaccata 60
gtttttccat acaaccgaaa aggaaactgg aaaaatgttc cttccaatta ccattattgc 120
ccgtcaagct cagatttaaa ttggcataat gacttaatag gcacagcctt acaagtcaaa 180
atgcccaaga gtcacaaggc tattcaagca gacggttgga tgtgtcatgc ttccaaatgg 240
gtcactactt gtgatttccg ctggtacgga ccgaagtata taacacattc catccgatcc 300
ttcactccat ctgtagaaca atgcaaggaa agcattgaac aaacgaaaca aggaacttgg 360
ctgaatccag gcttccctcc tcaaagttgt ggatatgcaa ctgtgacgga tgctgaagca 420
gcgattgtcc aggtgactcc tcaccatgtg cttgttgatg aatacacagg agaatgggtt 480
gattcacagt tcatcaacgg aaaatgcagc aatgacatat gccccactgt ccataactcc 540
acaacctggc attccgacta taagggtcaa gggctatgtg attctaacct catttccatg 600
gacatcacct tcttctcaga ggacggagag ctatcatccc taggaaagga gggcacaggg 660
ttcagaagta actactttgc ttatgaaact ggagacaagg cctgcaaaat gcagtactgc 720
aagcattggg gagtcagact cccatcaggt gtctggttcg agatggctga taaggatctc 780
tttgctgcag ccagattccc tgaatgccc gaagggtcaa gtatctctgc tccatctcag 840
acctcagtgg atgtaagtct cattcaggac gttgagagga tcttggatta ttccctctgc 900
caagaaacct ggagcaaaat cagagcgggt cttcccatct ctccagtgga tctcagctat 960
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tactttgaga ccagatacat cagagtcgat attgctgtc caatcctctc aagaatgggtc 1080
ggaatgatca gtggaactac cacagaaagg gaactgtggg atgactgggc tccatatgaa 1140
gacgtggaaa ttggaccaa tggagttctg aggaccagtt caggatataa gtttcttcta 1200
tatatgattg gacatggtat gttggactcc gatcttcac ttagctcaa ggctcaggtg 1260
tttgaacatc ctcacattca agacgctght gcgcagcttc ctgatgatga gactttattt 1320
tttggtgata ctgggctatc caaaaatcca atcgagtttg tagaaggttg gttcagtagt 1380
tggaagagct ctattgcctc ttttttcttt atcatagggt taatcattgg actattcttg 1440
gttctccgag ttggtattta tctttgcatt aaattaaagc acaccaagaa aagacagatt 1500
tatacagaca tagagatgaa ccgacttggg aagtaa 1536
```

<210> 40

<211> 1399

<212> DNA

<213> Vesicular stomatitis virus

<400> 40

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atgaagtgcc ttttgtactt agctttttta ttcacgggg tgaattgcaa gttcaccata 60
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gtttttccat acaacccaaa aggaaactgg aaaaatgttc cttccaatta ccattattgc 120
 ccgtaagct cagattttaa ttggcataat gacttaatat gcacagcctt acaggtcaaa 180
 atgcccaga gtcacaaggc tattcaagca gacggttgga tgtgtcatgc ttccaaatgg 240
 gtcactactt gtgatttccg ctggtacgga ccgaagtata taacacattc catccgatcc 300
 ttcaactccat ctgtagaaca atgcaaggaa agcattgaac aaacgaaaca aggaacttgg 360
 ctgaatccag gcttccctcc tcaaagtgtt ggatatgcaa ctgtgacgga tgctgaagca 420
 gcgattgtcc aggtgactcc tcaccatgtg cttgttgatg aatacacagg agaatgggtt 480
 gattcacagt tcatcaacgg aaaatgcagc aatgacatat gcccactgt ccataactcc 540
 acaacctggc attccgacta taaggtcaaa gggctatgtg attctaacct catttccatg 600
 gacatcacct tcttctcaga ggacggagag ctatcatccc taggaaagga gggcacaggg 660
 ttcagaagta actactttgc ttatgaaact ggagacaagg cctgcaaaat gcagtactgc 720
 aagcgttggg gagtcagact cccatcaggt gtctggttcg ggatggctga taaggatctc 780
 tttgtgcag ccagattccc tgaatgcccc gaagggtcaa gtatctctgc tccatctcag 840
 acctcagtgg atgtaagtct cattcaggac gttgagagga tcttactttg agaccagata 900
 catcagagtc gatattgctg ctccaatcct ctcaagaatg gtcggaatga tcagtgggaa 960
 taccacagaa agggaaactgt gggatgactg ggtccatat gaagacgtgg aaattggacc 1020
 caatggagtt ctgaggacca gttcaggata taagtttcc tttatatga ttggacatgg 1080
 tatgttggac tccgatcttc atcttagctc aaaggctcag gtgtttgaac atctcacat 1140
 tcaagacgct gcttcgcagc ttcctgatga tgagacttta ttttttgggtg atactgggct 1200
 atccaaaaat ccaatcgagt ttgtagaagg ttggttcagt agttggaaga gctctattgc 1260
 ctcttttttc tttatcatag ggttaatcat tggactattc ttggttctcc gagttggat 1320
 ttatctttgc attaaattaa agcacaccaa gaaaagacag atttatacag acatagagat 1380
 gaaccgactt gggaagtaa 1399

<210> 41
 <211> 511
 <212> PRT
 <213> Vesicular stomatitis virus

<400> 41
 Met Lys Cys Leu Leu Tyr Leu Ala Phe Leu Phe Ile Gly Val Asn Cys
 1 5 10 15
 Lys Phe Thr Ile Val Phe Pro His Asn Gln Lys Gly Asn Trp Lys Asn
 20 25 30
 Val Pro Ser Asn Tyr His Tyr Cys Pro Ser Ser Ser Asp Leu Asn Trp
 35 40 45
 His Asn Asp Leu Ile Gly Thr Ala Ile Gln Val Lys Met Pro Lys Ser
 50 55 60
 His Lys Ala Ile Gln Ala Asp Gly Trp Met Cys His Ala Ser Lys Trp
 65 70 75 80
 Val Thr Thr Cys Asp Phe Arg Trp Tyr Gly Pro Lys Tyr Ile Thr Gln
 85 90 95
 Ser Ile Arg Ser Phe Thr Pro Ser Val Glu Gln Cys Lys Glu Ser Ile
 100 105 110
 Glu Gln Thr Lys Gln Gly Thr Trp Leu Asn Pro Gly Phe Pro Pro Gln
 115 120 125
 Ser Cys Gly Tyr Ala Thr Val Thr Asp Ala Glu Ala Val Ile Val Gln
 130 135 140

Val Thr Pro His His Val Leu Val Asp Glu Tyr Thr Gly Glu Trp Val
 145 150 155 160
 Asp Ser Gln Phe Ile Asn Gly Lys Cys Ser Asn Tyr Ile Cys Pro Thr
 165 170 175
 Val His Asn Ser Thr Thr Trp His Ser Asp Tyr Lys Val Lys Gly Leu
 180 185 190
 Cys Asp Ser Asn Leu Ile Ser Met Asp Ile Thr Phe Phe Ser Glu Asp
 195 200 205
 Gly Glu Leu Ser Ser Leu Gly Lys Glu Gly Thr Gly Phe Arg Ser Asn
 210 215 220
 Tyr Phe Ala Tyr Glu Thr Gly Gly Lys Ala Cys Lys Met Gln Tyr Cys
 225 230 235 240
 Lys His Trp Gly Val Arg Leu Pro Ser Gly Val Trp Phe Glu Met Ala
 245 250 255
 Asp Lys Asp Leu Phe Ala Ala Ala Arg Phe Pro Glu Cys Pro Glu Gly
 260 265 270
 Ser Ser Ile Ser Ala Pro Ser Gln Thr Ser Val Asp Val Ser Leu Ile
 275 280 285
 Gln Asp Val Glu Arg Ile Leu Asp Tyr Ser Leu Cys Gln Glu Thr Trp
 290 295 300
 Ser Lys Ile Arg Ala Gly Leu Pro Ile Ser Pro Val Asp Leu Ser Tyr
 305 310 315 320
 Leu Ala Pro Lys Asn Pro Gly Thr Gly Pro Ala Phe Thr Ile Ile Asn
 325 330 335
 Gly Thr Leu Lys Tyr Phe Glu Thr Arg Tyr Ile Arg Val Asp Ile Ala
 340 345 350
 Ala Pro Ile Leu Ser Arg Met Val Gly Met Ile Ser Gly Thr Thr Thr
 355 360 365
 Glu Arg Glu Leu Trp Asp Asp Trp Ala Pro Tyr Glu Asp Val Glu Ile
 370 375 380
 Gly Pro Asn Gly Val Leu Arg Thr Ser Ser Gly Tyr Lys Phe Pro Leu
 385 390 395 400
 Tyr Met Ile Gly His Gly Met Leu Asp Ser Asp Leu His Leu Ser Ser
 405 410 415
 Lys Ala Gln Val Phe Glu His Pro His Ile Gln Asp Ala Ala Ser Gln
 420 425 430
 Leu Pro Asp Asp Glu Ser Leu Phe Phe Gly Asp Thr Gly Leu Ser Lys
 435 440 445

Asn Pro Ile Glu Leu Val Glu Gly Trp Phe Ser Ser Trp Lys Ser Ser
450 455 460

Ile Ala Ser Phe Phe Phe Ile Ile Gly Leu Ile Ile Gly Leu Phe Leu
465 470 475 480

Val Leu Arg Val Gly Ile His Leu Cys Ile Lys Leu Lys His Thr Lys
485 490 495

Lys Arg Gln Ile Tyr Thr Asp Ile Glu Met Asn Arg Leu Gly Lys
500 505 510

<210> 42

<211> 295

<212> PRT

<213> Vesicular stomatitis virus

<220>

<221> MOD_RES

<222> (1)..(295)

<223> "Xaa" represents any, other or unknown amino acid

<400> 42

Met Lys Cys Leu Leu Xaa Leu Ala Phe Leu Phe Ile Gly Val Asn Cys
1 5 10 15

Lys Phe Thr Ile Val Phe Pro Tyr Asn Gln Lys Gly Asn Trp Lys Asn
20 25 30

Val Pro Ser Asn Tyr His Tyr Cys Pro Ser Ser Ser Asp Leu Asn Xaa
35 40 45

His Asn Asp Leu Ile Gly Thr Ala Leu Gln Val Lys Met Pro Lys Ser
50 55 60

His Lys Ala Ile Gln Ala Asp Gly Trp Met Cys His Ala Ser Lys Trp
65 70 75 80

Val Thr Thr Cys Asp Phe Arg Trp Tyr Gly Pro Lys Tyr Ile Thr His
85 90 95

Ser Ile Arg Ser Phe Thr Pro Ser Val Glu Gln Cys Lys Glu Ser Ile
100 105 110

Glu Gln Thr Lys Gln Gly Thr Trp Leu Asn Pro Gly Phe Pro Pro Gln
115 120 125

Ser Cys Gly Tyr Ala Thr Val Thr Asp Ala Glu Ala Ala Ile Val Gln
130 135 140

Val Thr Pro His His Val Leu Val Asp Glu Tyr Thr Gly Glu Trp Val
145 150 155 160

Asp Ser Gln Phe Ile Asn Gly Lys Cys Ser Asn Asp Ile Cys Pro Thr
165 170 175

Val His Asn Ser Thr Thr Trp His Ser Asp Tyr Lys Val Lys Gly Leu
180 185 190

Cys Asp Ser Asn Leu Ile Ser Met Asp Ile Thr Phe Phe Ser Glu Asp
195 200 205

Gly Glu Leu Ser Ser Leu Gly Lys Glu Gly Thr Gly Phe Arg Ser Asn
210 215 220

Tyr Phe Ala Tyr Glu Thr Gly Asp Lys Ala Cys Lys Met Gln Tyr Cys
225 230 235 240

Lys Arg Trp Gly Val Arg Leu Pro Ser Gly Val Trp Phe Glu Met Ala
245 250 255

Asp Lys Asp Leu Phe Ala Ala Ala Arg Phe Pro Glu Cys Pro Glu Gly
260 265 270

Ser Ser Ile Ser Ala Pro Ser Gln Thr Ser Val Asp Val Ser Leu Ile
275 280 285

Gln Asp Val Glu Arg Ile Leu
290 295

<210> 43

<211> 234

<212> PRT

<213> Vesicular stomatitis virus

<400> 43

Pro Ser Gln Thr Ser Val Asp Val Ser Leu Ile Gln Asp Val Glu Arg
1 5 10 15

Ile Leu Asp Tyr Ser Leu Cys Gln Glu Thr Trp Ser Lys Ile Arg Ala
20 25 30

Gly Leu Pro Ile Ser Pro Val Asp Leu Ser Tyr Leu Ala Pro Lys Asn
35 40 45

Pro Gly Thr Gly Pro Val Phe Thr Ile Ile Asn Gly Thr Leu Lys Tyr
50 55 60

Phe Glu Thr Arg Tyr Ile Arg Val Asp Ile Ala Ala Pro Ile Leu Ser
65 70 75 80

Arg Met Val Gly Met Ile Ser Gly Thr Thr Thr Glu Arg Glu Leu Trp
85 90 95

Asp Asp Trp Ala Pro Tyr Glu Asp Val Glu Ile Gly Pro Asn Gly Val
100 105 110

Leu Arg Thr Ser Ser Gly Tyr Lys Phe Pro Leu Tyr Met Ile Gly His
115 120 125

Gly Met Leu Asp Ser Asp Leu His Leu Ser Ser Lys Ala Gln Val Phe

130	135	140
Glu His Pro His Ile Gln Asp Ala Ala Ser Gln Leu Pro Asp Asp Glu		
145	150	155 160
Thr Leu Phe Phe Gly Asp Thr Gly Leu Ser Lys Asn Pro Ile Glu Phe		
	165	170 175
Val Glu Gly Trp Phe Ser Ser Trp Lys Ser Ser Ile Ala Ser Phe Phe		
	180	185 190
Phe Ile Ile Gly Leu Ile Ile Gly Leu Phe Leu Val Leu Arg Val Gly		
	195	200 205
Ile Tyr Leu Cys Ile Lys Leu Lys His Thr Lys Lys Arg Gln Ile Tyr		
	210	215 220
Thr Asp Ile Glu Met Asn Arg Leu Gly Lys		
225	230	

<210> 44

<211> 511

<212> PRT

<213> Vesicular stomatitis virus

<220>

<221> MOD_RES

<222> (1)..(511)

<223> "Xaa" represents any, other or unknown amino acid

<400> 44

Met Lys Cys Leu Leu Tyr Leu Ala Phe Leu Phe Ile Gly Val Asn Cys
1 5 10 15

Lys Phe Thr Ile Val Phe Pro Tyr Asn Arg Lys Gly Asn Trp Lys Asn
20 25 30

Val Pro Ser Asn Tyr His Tyr Cys Pro Ser Ser Ser Asp Leu Asn Trp
35 40 45

His Asn Asp Leu Ile Gly Thr Ala Leu Gln Val Lys Met Pro Lys Ser
50 55 60

His Lys Ala Ile Gln Ala Asp Gly Trp Met Cys His Ala Ser Lys Trp
65 70 75 80

Val Thr Thr Cys Asp Phe Arg Trp Tyr Gly Pro Lys Tyr Ile Thr His
85 90 95

Ser Ile Arg Ser Phe Thr Pro Ser Val Glu Gln Cys Lys Glu Ser Ile
100 105 110

Glu Gln Thr Lys Gln Gly Thr Trp Leu Asn Pro Gly Phe Pro Pro Gln
115 120 125

Ser Cys Gly Tyr Ala Thr Val Thr Asp Ala Glu Ala Ala Ile Val Gln

130		135		140
Val Thr Pro His His Val Leu Val Asp Glu Tyr Thr Gly Glu Trp Val				
145		150		155 160
Asp Ser Gln Phe Ile Asn Gly Lys Cys Ser Asn Asp Ile Cys Pro Thr				
	165		170	175
Val His Asn Ser Thr Thr Trp His Ser Asp Tyr Lys Val Lys Gly Leu				
	180		185	190
Cys Asp Ser Asn Leu Ile Ser Met Asp Ile Thr Phe Phe Ser Glu Asp				
	195		200	205
Gly Glu Leu Ser Ser Leu Gly Lys Glu Gly Thr Gly Phe Arg Ser Asn				
	210		215	220
Tyr Phe Ala Tyr Glu Thr Gly Asp Lys Ala Cys Lys Met Gln Tyr Cys				
	225		230 235	240
Lys His Trp Gly Val Arg Leu Pro Ser Gly Val Trp Phe Glu Met Ala				
	245		250	255
Asp Lys Asp Leu Phe Ala Ala Ala Arg Phe Pro Glu Cys Pro Glu Gly				
	260		265	270
Ser Ser Ile Ser Ala Pro Ser Gln Thr Ser Val Asp Val Ser Leu Ile				
	275		280	285
Gln Asp Val Glu Arg Ile Leu Asp Tyr Ser Leu Cys Gln Glu Thr Trp				
	290		295	300
Ser Lys Ile Arg Ala Gly Leu Pro Ile Ser Pro Val Asp Leu Ser Tyr				
	305		310 315	320
Leu Ala Pro Lys Asn Pro Gly Thr Gly Pro Ala Phe Thr Ile Ile Asn				
	325		330	335
Gly Thr Leu Lys Tyr Phe Glu Thr Arg Tyr Ile Arg Val Asp Ile Ala				
	340		345	350
Ala Pro Ile Leu Ser Arg Met Val Gly Met Ile Ser Gly Thr Thr Thr				
	355		360	365
Glu Arg Glu Leu Trp Asp Asp Trp Ala Pro Tyr Glu Asp Val Glu Ile				
	370		375	380
Gly Pro Asn Gly Val Leu Arg Thr Ser Ser Gly Tyr Lys Phe Pro Leu				
	385		390 395	400
Tyr Met Ile Gly His Gly Met Leu Asp Ser Asp Leu His Leu Ser Ser				
	405		410	415
Lys Ala Gln Val Phe Glu His Pro His Ile Gln Asp Ala Xaa Ala Gln				
	420		425	430
Leu Pro Asp Asp Glu Thr Leu Phe Phe Gly Asp Thr Gly Leu Ser Lys				

435

440

445

Asn Pro Ile Glu Phe Val Glu Gly Trp Phe Ser Ser Trp Lys Ser Ser
450 455 460

Ile Ala Ser Phe Phe Phe Ile Ile Gly Leu Ile Ile Gly Leu Phe Leu
465 470 475 480

Val Leu Arg Val Gly Ile Tyr Leu Cys Ile Lys Leu Lys His Thr Lys
485 490 495

Lys Arg Gln Ile Tyr Thr Asp Ile Glu Met Asn Arg Leu Gly Lys
500 505 510

<210> 45

<211> 465

<212> PRT

<213> Vesicular stomatitis virus

<400> 45

Met Lys Cys Leu Leu Tyr Leu Ala Phe Leu Phe Ile Gly Val Asn Cys
1 5 10 15

Lys Phe Thr Ile Val Phe Pro Tyr Asn Gln Lys Gly Asn Trp Lys Asn
20 25 30

Val Pro Ser Asn Tyr His Tyr Cys Pro Ser Ser Ser Asp Leu Asn Trp
35 40 45

His Asn Asp Leu Ile Gly Thr Ala Leu Gln Val Lys Met Pro Lys Ser
50 55 60

His Lys Ala Ile Gln Ala Asp Gly Trp Met Cys His Ala Ser Lys Trp
65 70 75 80

Val Thr Thr Cys Asp Phe Arg Trp Tyr Gly Pro Lys Tyr Ile Thr His
85 90 95

Ser Ile Arg Ser Phe Thr Pro Ser Val Glu Gln Cys Lys Glu Ser Ile
100 105 110

Glu Gln Thr Lys Gln Gly Thr Trp Leu Asn Pro Gly Phe Pro Pro Gln
115 120 125

Ser Cys Gly Tyr Ala Thr Val Thr Asp Ala Glu Ala Ala Ile Val Gln
130 135 140

Val Thr Pro His His Val Leu Val Asp Glu Tyr Thr Gly Glu Trp Val
145 150 155 160

Asp Ser Gln Phe Ile Asn Gly Lys Cys Ser Asn Asp Ile Cys Pro Thr
165 170 175

Val His Asn Ser Thr Thr Trp His Ser Asp Tyr Lys Val Lys Gly Leu
180 185 190

Cys Asp Ser Asn Leu Ile Ser Met Asp Ile Thr Phe Phe Ser Glu Asp
 195 200 205
 Gly Glu Leu Ser Ser Leu Gly Lys Glu Gly Thr Gly Phe Arg Ser Asn
 210 215 220
 Tyr Phe Ala Tyr Glu Thr Gly Asp Lys Ala Cys Lys Met Gln Tyr Cys
 225 230 235 240
 Lys Arg Trp Gly Val Arg Leu Pro Ser Gly Val Trp Phe Gly Met Ala
 245 250 255
 Asp Lys Asp Leu Phe Ala Ala Ala Arg Phe Pro Glu Cys Pro Glu Gly
 260 265 270
 Ser Ser Ile Ser Ala Pro Ser Gln Thr Ser Val Asp Val Ser Leu Ile
 275 280 285
 Gln Asp Val Glu Arg Ile Tyr Phe Glu Thr Arg Tyr Ile Arg Val Asp
 290 295 300
 Ile Ala Ala Pro Ile Leu Ser Arg Met Val Gly Met Ile Ser Gly Thr
 305 310 315 320
 Thr Thr Glu Arg Glu Leu Trp Asp Asp Trp Ala Pro Tyr Glu Asp Val
 325 330 335
 Glu Ile Gly Pro Asn Gly Val Leu Arg Thr Ser Ser Gly Tyr Lys Phe
 340 345 350
 Pro Leu Tyr Met Ile Gly His Gly Met Leu Asp Ser Asp Leu His Leu
 355 360 365
 Ser Ser Lys Ala Gln Val Phe Glu His Pro His Ile Gln Asp Ala Ala
 370 375 380
 Ser Gln Leu Pro Asp Asp Glu Thr Leu Phe Phe Gly Asp Thr Gly Leu
 385 390 395 400
 Ser Lys Asn Pro Ile Glu Phe Val Glu Gly Trp Phe Ser Ser Trp Lys
 405 410 415
 Ser Ser Ile Ala Ser Phe Phe Phe Ile Ile Gly Leu Ile Ile Gly Leu
 420 425 430
 Phe Leu Val Leu Arg Val Gly Ile Tyr Leu Cys Ile Lys Leu Lys His
 435 440 445
 Thr Lys Lys Arg Gln Ile Tyr Thr Asp Ile Glu Met Asn Arg Leu Gly
 450 455 460
 Lys
 465

<210> 46

<211> 6330

<212> DNA

<213> Vesicular stomatitis virus

<400> 46

atggaagtcc	acgattttga	gaccgacgag	ttcaatgatt	tcaatgaaga	tgactatgcc	60
acaagagaat	tcctgaatcc	cgatgagcgc	atgacgtact	tgaatcatgc	tgattacaat	120
ttgaattctc	ctctaattag	tgatgatatt	gacaatttga	tcaggaaatt	caattctctt	180
ccgattccct	cgatgtggga	tagtaagaac	tgggatggag	ttcttgagat	gttaacatca	240
tgtcaagcca	atccccatctc	aacatctcag	atgcataaat	ggatgggaag	ttggttaatg	300
tctgataatc	atgatgccag	tcaagggtat	agttttttac	atgaagtgga	caaagaggca	360
gaaataacat	ttgacgtggt	ggagaccttc	atccgcggct	ggggcaacaa	accaattgaa	420
tacatcaaaa	aggaaagatg	gactgactca	ttcaaaattc	tcgcttattt	gtgtcaaaaag	480
tttttggact	tacacaagtt	gacattaatc	ttaaatgctg	tctctgaggt	ggaattgctc	540
aacttggcga	ggactttcaa	aggcaaagtc	agaagaagtt	ctcatggaac	gaacatatgc	600
aggattaggg	ttcccagctt	gggtcctact	tttattttcag	aaggatgggc	ttacttcaag	660
aaacttgata	ttctaattga	ccgaaacttt	ctgttaatgg	tcaaagatgt	gattataggg	720
aggatgcaaa	cggtgctatc	catggtatgt	agaatagaca	acctgttctc	agagcaagac	780
atcttctccc	ttctaaatat	ctacagaatt	ggagataaaa	ttgtggagag	gcagggaaat	840
ttttcttatg	acttgattaa	aatgggtgaa	ccgatatgca	acttgaagct	gatgaaatta	900
gcaagagaat	caaggccttt	agtcccacaa	ttccctcatt	ttgaaaatca	tatcaagact	960
tctgttgatg	aaggggcaaa	aattgaccga	ggtataagat	tcctccatga	tcagataatg	1020
agtgtgaaaa	cagtggatct	cacactgggtg	atttatggat	cgttcagaca	ttgggggtcat	1080
ccttttatag	attattacac	tggactagaa	aaattacatt	cccaagtaac	catgaagaaa	1140
gatattgatg	tgatcatatgc	aaaagcactt	gcaagtgatt	tagctcggat	tgttctattt	1200
caacagttca	atgatcataa	aaagtgggtc	gtgaatggag	acttgctccc	tcatgatcat	1260
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<212> DNA

<213> Vesicular stomatitis virus

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<213> Vesicular stomatitis virus

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<210> 50
<211> 2109
<212> PRT
<213> Vesicular stomatitis virus

<400> 50
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Tyr Leu Asn His Ala Asp Tyr Asn Leu Asn Ser Pro Leu Ile Ser Asp 45
35 40
Asp Ile Asp Asn Leu Ile Arg Lys Phe Asn Ser Leu Pro Ile Pro Ser 60
50 55
Met Trp Asp Ser Lys Asn Trp Asp Gly Val Leu Glu Met Leu Thr Ser 80
65 70 75
Cys Gln Ala Asn Pro Ile Ser Thr Ser Gln Met His Lys Trp Met Gly 95
85 90
Ser Trp Leu Met Ser Asp Asn His Asp Ala Ser Gln Gly Tyr Ser Phe 110
100 105
Leu His Glu Val Asp Lys Glu Ala Glu Ile Thr Phe Asp Val Val Glu 125
115 120
Thr Phe Ile Arg Gly Trp Gly Asn Lys Pro Ile Glu Tyr Ile Lys Lys 140
130 135
Glu Arg Trp Thr Asp Ser Phe Lys Ile Leu Ala Tyr Leu Cys Gln Lys 160
145 150 155
Phe Leu Asp Leu His Lys Leu Thr Leu Ile Leu Asn Ala Val Ser Glu 175
165 170
Val Glu Leu Leu Asn Leu Ala Arg Thr Phe Lys Gly Lys Val Arg Arg 190
180 185
Ser Ser His Gly Thr Asn Ile Cys Arg Ile Arg Val Pro Ser Leu Gly 205
195 200
Pro Thr Phe Ile Ser Glu Gly Trp Ala Tyr Phe Lys Lys Leu Asp Ile 220
210 215
Leu Met Asp Arg Asn Phe Leu Leu Met Val Lys Asp Val Ile Ile Gly 240
225 230 235
Arg Met Gln Thr Val Leu Ser Met Val Cys Arg Ile Asp Asn Leu Phe 255
245 250
Ser Glu Gln Asp Ile Phe Ser Leu Leu Asn Ile Tyr Arg Ile Gly Asp 270
260 265

Lys Ile Val Glu Arg Gln Gly Asn Phe Ser Tyr Asp Leu Ile Lys Met
 275 280 285
 Val Glu Pro Ile Cys Asn Leu Lys Leu Met Lys Leu Ala Arg Glu Ser
 290 295 300
 Arg Pro Leu Val Pro Gln Phe Pro His Phe Glu Asn His Ile Lys Thr
 305 310 315 320
 Ser Val Asp Glu Gly Ala Lys Ile Asp Arg Gly Ile Arg Phe Leu His
 325 330 335
 Asp Gln Ile Met Ser Val Lys Thr Val Asp Leu Thr Leu Val Ile Tyr
 340 345 350
 Gly Ser Phe Arg His Trp Gly His Pro Phe Ile Asp Tyr Tyr Thr Gly
 355 360 365
 Leu Glu Lys Leu His Ser Gln Val Thr Met Lys Lys Asp Ile Asp Val
 370 375 380
 Ser Tyr Ala Lys Ala Leu Ala Ser Asp Leu Ala Arg Ile Val Leu Phe
 385 390 395 400
 Gln Gln Phe Asn Asp His Lys Lys Trp Phe Val Asn Gly Asp Leu Leu
 405 410 415
 Pro His Asp His Pro Phe Lys Ser His Val Lys Glu Asn Thr Trp Pro
 420 425 430
 Thr Ala Ala Gln Val Gln Asp Phe Gly Asp Lys Trp His Glu Leu Pro
 435 440 445
 Leu Ile Lys Cys Phe Glu Ile Pro Asp Leu Leu Asp Pro Ser Ile Ile
 450 455 460
 Tyr Ser Asp Lys Ser His Ser Met Asn Arg Ser Glu Val Leu Lys His
 465 470 475 480
 Val Arg Met Asn Pro Asn Thr Pro Ile Pro Ser Lys Lys Val Leu Gln
 485 490 495
 Thr Met Leu Asp Thr Lys Ala Thr Asn Trp Lys Glu Phe Leu Lys Glu
 500 505 510
 Ile Asp Glu Lys Gly Leu Asp Asp Asp Asp Leu Ile Ile Gly Leu Lys
 515 520 525
 Gly Lys Glu Arg Glu Leu Lys Leu Ala Gly Arg Phe Phe Ser Leu Met
 530 535 540
 Ser Trp Lys Leu Arg Glu Tyr Phe Val Ile Thr Glu Tyr Leu Ile Lys
 545 550 555 560
 Thr His Phe Val Pro Met Phe Lys Gly Leu Thr Met Ala Asp Asp Leu
 565 570 575

Thr Ala Val Ile Lys Lys Met Leu Asp Ser Ser Ser Gly Gln Gly Leu
 580 585 590
 Lys Ser Tyr Glu Ala Ile Cys Ile Ala Asn His Ile Asp Tyr Glu Lys
 595 600 605
 Trp Asn Asn His Gln Arg Lys Leu Ser Asn Gly Pro Val Phe Arg Val
 610 615 620
 Met Gly Gln Phe Leu Gly Tyr Pro Ser Leu Ile Glu Arg Thr His Glu
 625 630 635 640
 Phe Phe Glu Lys Ser Leu Ile Tyr Tyr Asn Gly Arg Pro Asp Leu Met
 645 650 655
 Arg Val His Asn Asn Thr Leu Ile Asn Ser Thr Ser Gln Arg Val Cys
 660 665 670
 Trp Gln Gly Gln Glu Gly Gly Leu Glu Gly Leu Arg Gln Lys Gly Trp
 675 680 685
 Thr Ile Leu Asn Leu Leu Val Ile Gln Arg Glu Ala Lys Ile Arg Asn
 690 695 700
 Thr Ala Val Lys Val Leu Ala Gln Gly Asp Asn Gln Val Ile Cys Thr
 705 710 715 720
 Gln Tyr Lys Thr Lys Lys Ser Arg Asn Val Val Glu Leu Gln Gly Ala
 725 730 735
 Leu Asn Gln Met Val Ser Asn Asn Glu Lys Ile Met Thr Ala Ile Lys
 740 745 750
 Ile Gly Thr Gly Lys Leu Gly Leu Leu Ile Asn Asp Asp Glu Thr Met
 755 760 765
 Gln Ser Ala Asp Tyr Leu Asn Tyr Gly Lys Ile Pro Ile Phe Arg Gly
 770 775 780
 Val Ile Arg Gly Leu Glu Thr Lys Arg Trp Ser Arg Val Thr Cys Val
 785 790 795 800
 Thr Asn Asp Gln Ile Pro Thr Cys Ala Asn Ile Met Ser Ser Val Ser
 805 810 815
 Thr Asn Ala Leu Thr Val Ala His Phe Ala Glu Asn Pro Ile Asn Ala
 820 825 830
 Met Ile Gln Tyr Asn Tyr Phe Gly Thr Phe Ala Arg Leu Leu Leu Met
 835 840 845
 Met His Asp Pro Ala Leu Arg Gln Ser Leu Tyr Glu Val Gln Asp Lys
 850 855 860
 Ile Pro Gly Leu His Ser Ser Thr Phe Lys Tyr Ala Met Leu Tyr Leu
 865 870 875 880

Asp Pro Ser Ile Gly Gly Val Ser Gly Met Ser Leu Ser Arg Phe Leu
885 890 895

Ile Arg Ala Phe Pro Asp Pro Val Thr Glu Ser Leu Ser Phe Trp Arg
900 905 910

Phe Ile His Val His Ala Arg Ser Glu His Leu Lys Glu Met Ser Ala
915 920 925

Val Phe Gly Asn Pro Glu Ile Ala Lys Phe Arg Ile Thr His Ile Asp
930 935 940

Lys Leu Val Glu Asp Pro Thr Ser Leu Asn Ile Ala Met Gly Met Ser
945 950 955 960

Pro Ala Asn Leu Leu Lys Thr Glu Val Lys Lys Cys Leu Ile Glu Ser
965 970 975

Arg Gln Thr Ile Arg Asn Gln Val Ile Lys Asp Ala Thr Ile Tyr Leu
980 985 990

Tyr His Glu Glu Asp Arg Leu Arg Ser Phe Leu Trp Ser Ile Asn Pro
995 1000 1005

Leu Phe Pro Arg Phe Leu Ser Glu Phe Lys Ser Gly Thr Phe Leu Gly
1010 1015 1020

Val Ala Asp Gly Leu Ile Ser Leu Phe Gln Asn Ser Arg Thr Ile Arg
1025 1030 1035 1040

Asn Ser Phe Lys Lys Lys Tyr His Arg Glu Leu Asp Asp Leu Ile Val
1045 1050 1055

Arg Ser Glu Val Ser Ser Leu Thr His Leu Gly Lys Leu His Leu Arg
1060 1065 1070

Arg Gly Ser Cys Lys Met Trp Thr Cys Ser Ala Thr His Ala Asp Thr
1075 1080 1085

Leu Arg Tyr Lys Ser Trp Gly Arg Thr Val Ile Gly Thr Thr Val Pro
1090 1095 1100

His Pro Leu Glu Met Leu Gly Pro Gln His Arg Lys Glu Thr Pro Cys
1105 1110 1115 1120

Ala Pro Cys Asn Thr Ser Gly Phe Asn Tyr Val Ser Val His Cys Pro
1125 1130 1135

Asp Gly Ile His Asp Val Phe Ser Ser Arg Gly Pro Leu Pro Ala Tyr
1140 1145 1150

Leu Gly Ser Lys Thr Ser Glu Ser Thr Ser Ile Leu Gln Pro Trp Glu
1155 1160 1165

Arg Glu Ser Lys Val Pro Leu Ile Lys Arg Ala Thr Arg Leu Arg Asp
1170 1175 1180

Ala Ile Ser Trp Phe Val Glu Pro Asp Ser Lys Leu Ala Met Thr Ile
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 Leu Ser Asn Ile His Ser Leu Thr Gly Glu Glu Trp Thr Lys Arg Gln
 1205 1210 1215
 His Gly Phe Lys Arg Thr Gly Ser Ala Leu His Arg Phe Ser Thr Ser
 1220 1225 1230
 Arg Met Ser His Gly Gly Phe Ala Ser Gln Ser Thr Ala Ala Leu Thr
 1235 1240 1245
 Arg Leu Met Ala Thr Thr Asp Thr Met Arg Asp Leu Gly Asp Gln Asn
 1250 1255 1260
 Phe Asp Phe Leu Phe Gln Ala Thr Leu Leu Tyr Ala Gln Ile Thr Thr
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 Thr Val Ala Arg Asp Gly Trp Ile Thr Ser Cys Thr Asp His Tyr His
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 Ile Ala Cys Lys Ser Cys Leu Arg Pro Ile Glu Glu Ile Thr Leu Asp
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 Ser Ser Met Asp Tyr Thr Pro Pro Asp Val Ser His Val Leu Lys Thr
 1315 1320 1325
 Trp Arg Asn Gly Glu Gly Ser Trp Gly Gln Glu Ile Lys Gln Ile Tyr
 1330 1335 1340
 Pro Leu Glu Gly Asn Trp Lys Asn Leu Ala Pro Ala Glu Gln Ser Tyr
 1345 1350 1355 1360
 Gln Val Gly Arg Cys Ile Gly Phe Leu Tyr Gly Asp Leu Ala Tyr Arg
 1365 1370 1375
 Lys Ser Thr His Ala Glu Asp Ser Ser Leu Phe Pro Leu Ser Ile Gln
 1380 1385 1390
 Gly Arg Ile Arg Gly Arg Gly Phe Leu Lys Gly Leu Leu Asp Gly Leu
 1395 1400 1405
 Met Arg Ala Ser Cys Cys Gln Val Ile His Arg Arg Ser Leu Ala His
 1410 1415 1420
 Leu Lys Arg Pro Ala Asn Ala Val Tyr Gly Gly Leu Ile Tyr Leu Ile
 1425 1430 1435 1440
 Asp Lys Leu Ser Val Ser Pro Pro Phe Leu Ser Leu Thr Arg Ser Gly
 1445 1450 1455
 Pro Ile Arg Asp Glu Leu Glu Thr Ile Pro His Lys Ile Pro Thr Ser
 1460 1465 1470
 Tyr Pro Thr Ser Asn Arg Asp Met Gly Val Ile Val Arg Asn Tyr Phe
 1475 1480 1485

Lys Tyr Gln Cys Arg Leu Ile Glu Lys Gly Lys Tyr Arg Ser His Tyr
1490 1495 1500

Ser Gln Leu Trp Leu Phe Ser Asp Val Leu Ser Ile Asp Phe Ile Gly
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Pro Phe Ser Ile Ser Thr Thr Leu Leu Gln Ile Leu Tyr Lys Pro Phe
1525 1530 1535

Leu Ser Gly Lys Asp Lys Asn Glu Leu Arg Glu Leu Ala Asn Leu Ser
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Ser Leu Leu Arg Ser Gly Glu Gly Trp Glu Asp Ile His Val Lys Phe
1555 1560 1565

Phe Thr Lys Asp Ile Leu Leu Cys Pro Glu Glu Ile Arg His Ala Cys
1570 1575 1580

Lys Phe Gly Ile Ala Lys Asp Asn Asn Lys Asp Met Ser Tyr Pro Pro
1585 1590 1595 1600

Trp Gly Arg Glu Ser Arg Gly Thr Ile Thr Thr Ile Pro Val Tyr Tyr
1605 1610 1615

Thr Thr Thr Pro Tyr Pro Lys Met Leu Glu Met Pro Pro Arg Ile Gln
1620 1625 1630

Asn Pro Leu Leu Ser Gly Ile Arg Leu Gly Gln Leu Pro Thr Gly Ala
1635 1640 1645

His Tyr Lys Ile Arg Ser Ile Leu His Gly Met Gly Ile His Tyr Arg
1650 1655 1660

Asp Phe Leu Ser Cys Gly Asp Gly Ser Gly Gly Met Thr Ala Ala Leu
1665 1670 1675 1680

Leu Arg Glu Asn Val His Ser Arg Gly Ile Phe Asn Ser Leu Leu Glu
1685 1690 1695

Leu Ser Gly Ser Val Met Arg Gly Ala Ser Pro Glu Pro Pro Ser Ala
1700 1705 1710

Leu Glu Thr Leu Gly Gly Asp Lys Ser Arg Cys Val Asn Gly Glu Thr
1715 1720 1725

Cys Trp Glu Tyr Pro Ser Asp Leu Cys Asp Pro Arg Thr Trp Asp Tyr
1730 1735 1740

Phe Leu Arg Leu Lys Ala Gly Leu Gly Leu Gln Ile Asp Leu Ile Val
1745 1750 1755 1760

Met Asp Met Glu Val Arg Asp Ser Ser Thr Ser Leu Lys Ile Glu Thr
1765 1770 1775

Asn Val Arg Asn Tyr Val His Arg Ile Leu Asp Glu Gln Gly Val Leu
1780 1785 1790

Ile Tyr Lys Thr Tyr Gly Thr Tyr Ile Cys Glu Ser Glu Lys Asn Ala
 1795 1800 1805
 Val Thr Ile Leu Gly Pro Met Phe Lys Thr Val Asp Leu Val Gln Thr
 1810 1815 1820
 Glu Phe Ser Ser Ser Gln Thr Ser Glu Val Tyr Met Val Cys Lys Gly
 1825 1830 1835 1840
 Leu Lys Lys Leu Ile Asp Glu Pro Asn Pro Asp Trp Ser Ser Ile Asn
 1845 1850 1855
 Glu Ser Trp Lys Asn Leu Tyr Ala Phe Gln Ser Ser Glu Gln Glu Phe
 1860 1865 1870
 Ala Arg Ala Lys Lys Val Ser Thr Tyr Phe Thr Leu Thr Gly Ile Pro
 1875 1880 1885
 Ser Gln Phe Ile Pro Asp Pro Phe Val Asn Ile Glu Thr Met Leu Gln
 1890 1895 1900
 Ile Phe Gly Val Pro Thr Gly Val Ser His Ala Ala Ala Leu Lys Ser
 1905 1910 1915 1920
 Ser Asp Arg Pro Ala Asp Leu Leu Thr Ile Ser Leu Phe Tyr Met Ala
 1925 1930 1935
 Ile Ile Ser Tyr Tyr Asn Ile Asn His Ile Arg Val Gly Pro Ile Pro
 1940 1945 1950
 Pro Asn Pro Pro Ser Asp Gly Ile Ala Gln Asn Val Gly Ile Ala Ile
 1955 1960 1965
 Thr Gly Ile Ser Phe Trp Leu Ser Leu Met Glu Lys Asp Ile Pro Leu
 1970 1975 1980
 Tyr Gln Gln Cys Leu Ala Val Ile Gln Gln Ser Phe Pro Ile Arg Trp
 1985 1990 1995 2000
 Glu Ala Val Ser Val Lys Gly Gly Tyr Lys Gln Lys Trp Ser Thr Arg
 2005 2010 2015
 Gly Asp Gly Leu Pro Lys Asp Thr Arg Thr Ser Asp Ser Leu Ala Pro
 2020 2025 2030
 Ile Gly Asn Trp Ile Arg Ser Leu Glu Leu Val Arg Asn Gln Val Arg
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 2050 2055 2060
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Leu Lys Ser Asp Leu His Glu Glu Asn Ser Trp Arg Asp
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<210> 51

<211> 1753

<212> PRT

<213> Vesicular stomatitis virus

<220>

<221> MOD_RES

<222> (1)..(1753)

<223> "Xaa" represents any, other or unknown amino acid

<400> 51

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20 25 30

Ala Leu Ala Ser Asp Leu Ala Arg Ile Val Leu Phe Gln Gln Phe Asn
35 40 45

Asp His Xaa Lys Trp Phe Val Asn Gly Asp Leu Leu Pro His Asp His
50 55 60

Pro Phe Lys Ser His Val Lys Glu Asn Thr Trp Pro Thr Ala Ala Gln
65 70 75 80

Val Gln Asp Phe Gly Asp Lys Trp His Glu Leu Pro Leu Ile Lys Cys
85 90 95

Phe Glu Ile Pro Asp Leu Leu Asp Pro Ser Ile Ile Tyr Ser Asp Lys
100 105 110

Ser His Ser Met Asn Arg Ser Glu Val Leu Lys His Val Arg Met Asn
115 120 125

Pro Asn Thr Pro Ile Pro Ser Lys Lys Val Leu Gln Thr Met Leu Asp
130 135 140

Thr Lys Ala Thr Asn Trp Lys Glu Phe Leu Lys Glu Ile Asp Glu Lys
145 150 155 160

Gly Leu Asp Asp Asp Asp Leu Ile Ile Gly Leu Lys Gly Lys Glu Arg
165 170 175

Glu Leu Lys Leu Ala Gly Arg Phe Phe Ser Leu Met Ser Trp Lys Leu
180 185 190

Arg Glu Tyr Phe Val Ile Thr Glu Tyr Leu Ile Lys Thr His Phe Val
195 200 205

Pro Met Phe Lys Gly Leu Thr Met Ala Asp Asp Leu Thr Ala Val Ile
210 215 220

Lys Lys Met Leu Asp Ser Ser Ser Gly Gln Gly Leu Lys Ser Tyr Glu
 225 230 235 240
 Ala Ile Cys Ile Ala Asn His Ile Asp Tyr Glu Lys Trp Asn Asn His
 245 250 255
 Gln Arg Lys Leu Ser Asn Gly Pro Val Phe Arg Val Met Gly Gln Phe
 260 265 270
 Leu Gly Tyr Pro Ser Leu Ile Glu Arg Thr His Glu Phe Phe Glu Lys
 275 280 285
 Ser Leu Ile Tyr Tyr Asn Gly Arg Pro Asp Leu Met Arg Val His Asn
 290 295 300
 Asn Thr Leu Ile Asn Ser Thr Ser Gln Arg Val Cys Trp Gln Gly Gln
 305 310 315 320
 Glu Gly Gly Leu Glu Gly Leu Arg Gln Lys Gly Trp Ser Ile Leu Asn
 325 330 335
 Leu Leu Val Ile Gln Arg Glu Ala Lys Ile Arg Asn Thr Ala Val Lys
 340 345 350
 Val Leu Ala Gln Gly Asp Asn Gln Val Ile Cys Thr Gln Tyr Lys Thr
 355 360 365
 Lys Lys Ser Arg Asn Val Val Glu Leu Gln Gly Ala Leu Asn Gln Met
 370 375 380
 Val Ser Asn Asn Glu Lys Ile Met Thr Ala Ile Lys Ile Gly Thr Gly
 385 390 395 400
 Lys Leu Gly Leu Leu Ile Asn Asp Asp Glu Thr Met Gln Ser Ala Asp
 405 410 415
 Tyr Leu Asn Tyr Gly Lys Ile Pro Ile Phe Arg Gly Val Ile Arg Gly
 420 425 430
 Leu Glu Thr Lys Arg Trp Ser Arg Val Thr Cys Val Thr Asn Asp Gln
 435 440 445
 Ile Pro Thr Cys Ala Asn Ile Met Ser Ser Val Ser Thr Asn Ala Leu
 450 455 460
 Thr Val Ala His Phe Ala Glu Asn Pro Ile Asn Ala Met Ile Gln Tyr
 465 470 475 480
 Asn Tyr Phe Gly Thr Phe Ala Arg Leu Leu Leu Met Met His Asp Pro
 485 490 495
 Ala Leu Arg Gln Ser Leu Tyr Glu Val Gln Asp Lys Ile Pro Gly Leu
 500 505 510
 His Ser Ser Thr Phe Lys Tyr Ala Met Leu Tyr Leu Asp Pro Ser Ile
 515 520 525

Gly 530	Gly 530	Val	Ser	Gly	Met	Ser	Leu	Ser	Arg	Phe	Leu	Ile	Arg	Ala	Phe
Pro 545	Asp	Pro	Val	Thr	Glu 550	Ser	Leu	Ser	Phe	Trp 555	Arg	Phe	Ile	His	Val 560
His	Ala	Arg	Ser	Glu 565	His	Leu	Lys	Glu	Met 570	Ser	Ala	Val	Phe	Gly 575	Asn
Pro	Glu	Ile	Ala 580	Lys	Phe	Arg	Ile	Thr 585	His	Ile	Asp	Lys	Leu 590	Val	Glu
Asp	Pro	Thr 595	Ser	Leu	Asn	Ile	Ala 600	Met	Gly	Met	Ser	Pro 605	Ala	Asn	Leu
Leu	Lys 610	Thr	Glu	Val	Lys	Lys 615	Cys	Leu	Ile	Glu	Ser 620	Arg	Gln	Thr	Ile
Arg 625	Asn	Gln	Val	Ile	Lys 630	Asp	Ala	Thr	Ile	Tyr 635	Leu	Tyr	His	Glu	Glu 640
Asp	Arg	Leu	Arg	Ser 645	Phe	Leu	Trp	Ser	Ile 650	Asn	Pro	Leu	Phe	Pro 655	Arg
Phe	Leu	Ser	Glu 660	Phe	Lys	Ser	Gly	Thr 665	Phe	Leu	Gly	Val	Ala 670	Asp	Gly
Leu	Ile 675	Ser	Leu	Phe	Gln	Asn	Ser 680	Arg	Thr	Ile	Arg 685	Asn	Ser	Phe	Lys
Lys 690	Lys	Tyr	His	Arg	Glu	Leu 695	Asp	Asp	Leu	Ile	Val 700	Arg	Ser	Glu	Val
Ser 705	Ser	Leu	Thr	His	Leu 710	Gly	Lys	Leu	His	Leu 715	Arg	Arg	Gly	Ser	Cys 720
Lys	Met	Trp	Thr	Cys 725	Ser	Ala	Thr	His	Ala 730	Asp	Thr	Leu	Arg	Tyr 735	Lys
Ser	Trp	Gly	Arg 740	Thr	Val	Ile	Gly	Thr 745	Thr	Val	Pro	His 750	Pro	Leu	Glu
Met	Leu	Gly 755	Pro	Gln	His	Arg	Lys 760	Glu	Thr	Pro	Cys 765	Ala	Pro	Cys	Asn
Thr 770	Ser	Gly	Phe	Asn	Tyr	Val 775	Ser	Val	His	Cys 780	Pro	Asp	Gly	Ile	His
Asp 785	Val	Phe	Ser	Ser	Arg 790	Gly	Pro	Leu	Pro	Ala 795	Tyr	Leu	Gly	Ser	Lys 800
Thr	Ser	Glu	Ser	Thr 805	Ser	Ile	Leu	Gln	Pro 810	Trp	Glu	Arg	Glu	Ser 815	Lys
Val	Pro	Leu	Ile 820	Lys	Arg	Ala	Thr	Arg 825	Leu	Arg	Asp	Ala	Ile 830	Ser	Trp

Phe Val Glu Pro Asp Ser Lys Leu Ala Met Thr Ile Leu Ser Asn Ile
 835 840 845

His Ser Leu Thr Gly Glu Glu Trp Thr Lys Arg Gln His Gly Phe Lys
 850 855 860

Arg Thr Gly Ser Ala Leu His Arg Phe Ser Thr Ser Arg Met Ser His
 865 870 875 880

Gly Gly Phe Ala Ser Gln Ser Thr Ala Ala Leu Thr Arg Leu Met Ala
 885 890 895

Thr Thr Asp Thr Met Arg Asp Leu Gly Asp Gln Asn Phe Asp Phe Leu
 900 905 910

Phe Gln Ala Thr Leu Leu Tyr Ala Gln Ile Thr Thr Thr Val Ala Arg
 915 920 925

Asp Gly Trp Ile Thr Ser Cys Thr Asp His Tyr His Ile Ala Cys Lys
 930 935 940

Ser Cys Leu Arg Pro Ile Glu Glu Ile Thr Leu Asp Ser Ser Met Asp
 945 950 955 960

Tyr Thr Pro Pro Asp Val Ser His Val Leu Lys Thr Trp Arg Asn Gly
 965 970 975

Glu Gly Ser Trp Gly Gln Glu Ile Lys Gln Ile Tyr Pro Leu Glu Gly
 980 985 990

Asn Trp Lys Asn Leu Ala Pro Ala Glu Gln Ser Tyr Gln Val Gly Arg
 995 1000 1005

Cys Ile Gly Phe Leu Tyr Gly Asp Leu Ala Tyr Arg Lys Ser Thr His
 1010 1015 1020

Ala Glu Asp Ser Ser Leu Phe Pro Leu Ser Ile Gln Gly Arg Ile Arg
 1025 1030 1035 1040

Gly Arg Gly Phe Leu Lys Gly Leu Leu Asp Gly Leu Met Arg Ala Ser
 1045 1050 1055

Cys Cys Gln Val Ile His Arg Arg Ser Leu Ala His Leu Lys Arg Pro
 1060 1065 1070

Ala Asn Ala Val Tyr Gly Gly Leu Ile Tyr Leu Ile Asp Lys Leu Ser
 1075 1080 1085

Val Ser Pro Pro Phe Leu Ser Leu Thr Arg Ser Gly Pro Ile Arg Asp
 1090 1095 1100

Glu Leu Glu Thr Ile Pro His Lys Ile Pro Thr Ser Tyr Pro Thr Ser
 1105 1110 1115 1120

Asn Arg Asp Met Gly Val Ile Val Arg Asn Tyr Phe Lys Tyr Gln Cys
 1125 1130 1135

Arg Leu Ile Glu Lys Gly Lys Tyr Arg Ser His Tyr Ser Gln Leu Trp
 1140 1145 1150
 Leu Phe Ser Asp Val Leu Ser Ile Asp Phe Ile Gly Pro Phe Ser Ile
 1155 1160 1165
 Ser Thr Thr Leu Leu Gln Ile Leu Tyr Lys Pro Phe Leu Ser Gly Lys
 1170 1175 1180
 Asp Lys Asn Glu Leu Arg Glu Leu Ala Asn Leu Ser Ser Leu Leu Arg
 1185 1190 1195 1200
 Ser Gly Glu Gly Trp Glu Asp Ile His Val Lys Phe Phe Thr Lys Asp
 1205 1210 1215
 Ile Leu Leu Cys Pro Glu Glu Ile Arg His Ala Cys Lys Phe Gly Ile
 1220 1225 1230
 Ala Lys Asp Asn Asn Lys Asp Met Ser Tyr Pro Pro Trp Gly Arg Glu
 1235 1240 1245
 Ser Arg Gly Thr Ile Thr Thr Ile Pro Val Tyr Tyr Thr Thr Thr Pro
 1250 1255 1260
 Tyr Pro Lys Met Leu Glu Met Pro Pro Arg Ile Gln Asn Pro Leu Leu
 1265 1270 1275 1280
 Ser Gly Ile Arg Leu Gly Gln Leu Pro Thr Gly Ala His Tyr Lys Ile
 1285 1290 1295
 Arg Ser Ile Leu His Gly Met Gly Ile His Tyr Arg Asp Phe Leu Ser
 1300 1305 1310
 Cys Gly Asp Gly Ser Gly Gly Met Thr Ala Ala Leu Leu Arg Glu Asn
 1315 1320 1325
 Val His Ser Arg Gly Ile Phe Asn Ser Leu Leu Glu Leu Ser Gly Ser
 1330 1335 1340
 Val Met Arg Gly Ala Ser Pro Glu Pro Pro Ser Ala Leu Glu Thr Leu
 1345 1350 1355 1360
 Gly Gly Asp Lys Ser Arg Cys Val Asn Gly Glu Thr Cys Trp Glu Tyr
 1365 1370 1375
 Pro Ser Asp Leu Cys Asp Pro Arg Thr Trp Asp Tyr Phe Leu Arg Leu
 1380 1385 1390
 Lys Ala Gly Leu Gly Leu Gln Ile Asp Leu Ile Val Met Asp Met Glu
 1395 1400 1405
 Val Arg Asp Ser Ser Thr Ser Leu Lys Ile Glu Thr Asn Val Arg Asn
 1410 1415 1420
 Tyr Val His Arg Ile Leu Asp Glu Gln Gly Val Leu Ile Tyr Lys Thr
 1425 1430 1435 1440

Tyr Gly Thr Tyr Ile Cys Glu Ser Glu Lys Asn Ala Val Thr Ile Leu
1445 1450 1455

Gly Pro Met Phe Lys Thr Val Asp Leu Val Gln Thr Glu Phe Ser Ser
1460 1465 1470

Ser Gln Thr Ser Glu Val Tyr Met Val Cys Lys Gly Leu Lys Lys Leu
1475 1480 1485

Ile Asp Glu Pro Asn Pro Asp Trp Ser Ser Ile Asn Glu Ser Trp Lys
1490 1495 1500

Asn Leu Tyr Ala Phe Gln Ser Ser Glu Gln Glu Phe Ala Arg Ala Lys
1505 1510 1515 1520

Lys Val Ser Thr Tyr Phe Thr Leu Thr Gly Ile Pro Ser Gln Phe Ile
1525 1530 1535

Pro Asp Pro Phe Val Asn Ile Glu Thr Met Leu Gln Ile Phe Gly Val
1540 1545 1550

Pro Thr Gly Val Ser His Ala Ala Ala Leu Lys Ser Ser Asp Arg Pro
1555 1560 1565

Ala Asp Leu Leu Thr Ile Ser Leu Phe Tyr Met Ala Ile Ile Ser Tyr
1570 1575 1580

Tyr Asn Ile Asn His Ile Arg Val Gly Pro Ile Pro Pro Asn Pro Pro
1585 1590 1595 1600

Ser Asp Gly Ile Ala Gln Asn Val Gly Ile Ala Ile Thr Gly Ile Ser
1605 1610 1615

Phe Trp Leu Ser Leu Met Glu Lys Asp Ile Pro Leu Tyr Gln Gln Cys
1620 1625 1630

Leu Ala Val Ile Gln Gln Ser Phe Pro Ile Arg Trp Glu Ala Val Ser
1635 1640 1645

Val Lys Gly Gly Tyr Lys Gln Lys Trp Ser Thr Arg Gly Asp Gly Leu
1650 1655 1660

Pro Lys Asp Thr Arg Ile Ser Asp Ser Leu Ala Pro Ile Gly Asn Trp
1665 1670 1675 1680

Ile Arg Ser Leu Glu Leu Val Arg Asn Gln Val Arg Leu Asn Pro Phe
1685 1690 1695

Asn Glu Ile Leu Phe Asn Gln Leu Cys Arg Thr Val Asp Asn His Leu
1700 1705 1710

Lys Trp Ser Asn Leu Arg Lys Asn Thr Gly Met Ile Glu Trp Ile Asn
1715 1720 1725

Arg Arg Ile Ser Lys Glu Asp Arg Ser Ile Leu Met Leu Lys Ser Asp
1730 1735 1740

Leu His Glu Glu Asn Ser Trp Arg Asp
1745 1750

<210> 52

<211> 2109

<212> PRT

<213> Vesicular stomatitis virus

<220>

<221> MOD_RES

<222> (1)..(2109)

<223> "Xaa" represents any, other or unknown amino acid

<400> 52

Met Glu Val His Asp Phe Glu Thr Asp Glu Phe Asn Asp Phe Asn Glu
1 5 10 15

Asp Asp Tyr Ala Thr Arg Glu Phe Leu Asn Pro Asp Glu Arg Met Thr
20 25 30

Tyr Leu Asn His Ala Asp Tyr Asn Leu Asn Ser Pro Leu Ile Ser Asp
35 40 45

Asp Ile Asp Asn Leu Ile Arg Lys Phe Asn Ser Leu Pro Ile Pro Ser
50 55 60

Met Trp Asp Ser Lys Asn Trp Asp Gly Val Leu Glu Met Leu Thr Ser
65 70 75 80

Cys Gln Ala Asn Pro Ile Ser Thr Ser Gln Met His Lys Trp Met Gly
85 90 95

Ser Trp Leu Met Ser Asp Asn His Asp Ala Ser Gln Gly Tyr Ser Phe
100 105 110

Leu His Glu Val Asp Lys Glu Ala Glu Ile Thr Phe Asp Val Val Glu
115 120 125

Thr Phe Ile Arg Gly Trp Gly Asn Lys Pro Ile Glu Tyr Ile Lys Lys
130 135 140

Glu Arg Trp Thr Asp Ser Phe Lys Ile Leu Ala Tyr Leu Cys Gln Lys
145 150 155 160

Phe Leu Asp Leu His Lys Leu Thr Leu Ile Leu Asn Ala Val Ser Glu
165 170 175

Val Glu Leu Leu Asn Leu Ala Arg Thr Phe Lys Gly Lys Val Arg Arg
180 185 190

Ser Ser His Gly Thr Asn Ile Cys Arg Leu Arg Val Pro Ser Leu Gly
195 200 205

Pro Thr Phe Ile Ser Glu Gly Trp Ala Tyr Phe Lys Lys Leu Asp Ile
210 215 220

Leu Met Asp Arg Asn Phe Leu Leu Met Val Lys Asp Val Ile Ile Gly
 225 230 235 240
 Arg Met Gln Thr Val Leu Ser Met Val Cys Arg Ile Asp Asn Leu Phe
 245 250 255
 Ser Glu Gln Asp Ile Phe Ser Leu Leu Asn Ile Tyr Arg Ile Gly Asp
 260 265 270
 Lys Ile Val Glu Arg Gln Gly Asn Phe Ser Tyr Asp Leu Ile Lys Met
 275 280 285
 Val Glu Pro Ile Cys Asn Leu Arg Leu Met Lys Leu Ala Arg Glu Ser
 290 295 300
 Arg Pro Leu Val Pro Gln Phe Pro His Phe Glu Asn His Ile Lys Thr
 305 310 315 320
 Ser Val Asp Glu Gly Ala Lys Ile Asp Arg Gly Ile Arg Phe Leu His
 325 330 335
 Asp Gln Ile Met Ser Val Lys Thr Val Asp Leu Thr Leu Val Ile Tyr
 340 345 350
 Gly Ser Phe Arg His Trp Gly His Pro Phe Ile Asp Tyr Tyr Ala Gly
 355 360 365
 Leu Glu Lys Leu His Ser Gln Val Thr Met Lys Lys Asp Ile Asp Val
 370 375 380
 Ser Tyr Ala Lys Ala Leu Ala Ser Asp Leu Ala Arg Ile Val Leu Phe
 385 390 395 400
 Gln Gln Phe Asn Asp His Lys Lys Trp Phe Val Asn Gly Asp Leu Leu
 405 410 415
 Pro His Asp His Pro Phe Lys Ser His Val Lys Glu Asn Thr Trp Pro
 420 425 430
 Thr Ala Ala Gln Val Gln Asp Phe Gly Asp Lys Trp His Glu Leu Pro
 435 440 445
 Leu Ile Lys Cys Phe Glu Ile Pro Asp Leu Leu Asp Pro Ser Ile Ile
 450 455 460
 Tyr Ser Asp Lys Ser His Ser Met Asn Arg Ser Glu Val Leu Lys His
 465 470 475 480
 Val Arg Met Asn Pro Asn Thr Pro Ile Pro Ser Lys Lys Val Leu Gln
 485 490 495
 Thr Met Leu Asp Thr Lys Ala Thr Asn Trp Lys Glu Phe Leu Lys Glu
 500 505 510
 Ile Asp Glu Lys Gly Leu Asp Asp Asp Asp Leu Ile Ile Gly Leu Lys
 515 520 525

Gly	Lys	Glu	Arg	Glu	Leu	Lys	Leu	Ala	Gly	Arg	Phe	Phe	Ser	Leu	Met	530	535	540
Ser	Trp	Lys	Leu	Arg	Glu	Tyr	Phe	Val	Ile	Thr	Glu	Tyr	Leu	Ile	Lys	545	550	555 560
Thr	His	Phe	Val	Pro	Met	Phe	Lys	Gly	Leu	Thr	Met	Ala	Asp	Asp	Leu	565	570	575
Thr	Ala	Val	Ile	Lys	Lys	Met	Leu	Asp	Ser	Ser	Ser	Gly	Gln	Gly	Leu	580	585	590
Lys	Ser	Tyr	Glu	Ala	Ile	Cys	Ile	Ala	Asn	His	Ile	Asp	Tyr	Glu	Lys	595	600	605
Trp	Asn	Asn	His	Gln	Arg	Lys	Leu	Ser	Asn	Gly	Pro	Val	Phe	Arg	Val	610	615	620
Met	Gly	Gln	Phe	Leu	Gly	Tyr	Pro	Ser	Leu	Ile	Glu	Arg	Thr	His	Glu	625	630	635 640
Phe	Phe	Glu	Lys	Ser	Leu	Ile	Tyr	Tyr	Asn	Gly	Arg	Pro	Asp	Leu	Met	645	650	655
Arg	Val	His	Asn	Asn	Thr	Leu	Ile	Asn	Ser	Thr	Ser	Gln	Arg	Val	Cys	660	665	670
Trp	Gln	Gly	Gln	Glu	Gly	Gly	Leu	Glu	Gly	Leu	Arg	Gln	Lys	Gly	Trp	675	680	685
Ser	Ile	Leu	Asn	Leu	Leu	Val	Ile	Gln	Arg	Glu	Ala	Lys	Ile	Arg	Asn	690	695	700
Thr	Ala	Val	Lys	Val	Leu	Ala	Gln	Gly	Asp	Asn	Gln	Val	Ile	Cys	Thr	705	710	715 720
Gln	Tyr	Lys	Thr	Lys	Lys	Ser	Arg	Asn	Val	Val	Glu	Leu	Gln	Gly	Ala	725	730	735
Leu	Asn	Gln	Met	Val	Ser	Asn	Asn	Glu	Lys	Ile	Met	Thr	Ala	Ile	Lys	740	745	750
Ile	Gly	Thr	Gly	Lys	Leu	Gly	Leu	Leu	Ile	Asn	Asp	Asp	Glu	Thr	Met	755	760	765
Gln	Ser	Ala	Asp	Tyr	Leu	Asn	Tyr	Gly	Lys	Ile	Pro	Ile	Phe	Arg	Gly	770	775	780
Val	Ile	Arg	Gly	Leu	Glu	Thr	Lys	Arg	Trp	Ser	Arg	Val	Thr	Cys	Val	785	790	795 800
Thr	Asn	Asp	Gln	Ile	Pro	Thr	Cys	Ala	Asn	Ile	Met	Ser	Ser	Val	Ser	805	810	815
Thr	Asn	Ala	Leu	Thr	Val	Ala	His	Phe	Ala	Glu	Asn	Pro	Ile	Asn	Ala	820	825	830

Met Ile Gln Tyr Asn Tyr Phe Gly Thr Phe Ala Arg Leu Leu Leu Met
 835 840 845
 Met His Asp Pro Ala Leu Arg Gln Ser Leu Tyr Glu Val Gln Asp Lys
 850 855 860
 Ile Pro Gly Leu His Ser Ser Thr Phe Lys Tyr Ala Met Leu Tyr Leu
 865 870 875 880
 Asp Pro Ser Ile Gly Gly Val Ser Gly Met Ser Leu Ser Arg Phe Leu
 885 890 895
 Ile Arg Ala Phe Pro Asp Pro Val Thr Glu Ser Leu Ser Phe Trp Arg
 900 905 910
 Phe Ile His Val His Ala Arg Ser Glu His Leu Lys Glu Met Ser Ala
 915 920 925
 Val Phe Gly Asn Pro Glu Ile Ala Lys Phe Arg Ile Thr His Ile Asp
 930 935 940
 Lys Leu Val Glu Asp Pro Thr Ser Leu Asn Ile Ala Met Gly Met Ser
 945 950 955 960
 Pro Ala Asn Leu Leu Lys Thr Glu Val Lys Lys Cys Leu Ile Glu Ser
 965 970 975
 Arg Gln Thr Ile Arg Asn Gln Val Ile Lys Asp Ala Thr Ile Tyr Leu
 980 985 990
 Tyr His Glu Glu Asp Arg Leu Arg Ser Phe Leu Trp Ser Ile Asn Pro
 995 1000 1005
 Leu Phe Pro Arg Phe Leu Ser Glu Phe Lys Ser Gly Thr Phe Leu Gly
 1010 1015 1020
 Val Ala Asp Gly Leu Ile Ser Leu Phe Gln Asn Ser Arg Thr Ile Arg
 1025 1030 1035 1040
 Asn Ser Phe Lys Lys Lys Tyr His Arg Glu Leu Asp Asp Leu Ile Val
 1045 1050 1055
 Arg Ser Glu Val Ser Ser Leu Thr His Leu Gly Lys Leu His Leu Arg
 1060 1065 1070
 Arg Gly Ser Cys Lys Met Trp Thr Cys Ser Ala Thr His Ala Asp Thr
 1075 1080 1085
 Leu Arg Tyr Lys Ser Trp Gly Arg Thr Val Ile Gly Thr Thr Val Pro
 1090 1095 1100
 His Pro Leu Glu Met Leu Gly Pro Gln His Arg Lys Glu Thr Pro Cys
 1105 1110 1115 1120
 Ala Pro Cys Asn Thr Ser Gly Phe Asn Tyr Val Ser Val His Cys Pro
 1125 1130 1135

Asp Gly Ile His Asp Val Phe Ser Ser Arg Gly Pro Leu Pro Ala Tyr
1140 1145 1150

Leu Gly Ser Lys Thr Ser Glu Ser Thr Ser Ile Leu Gln Pro Trp Glu
1155 1160 1165

Arg Glu Ser Lys Val Pro Leu Ile Lys Arg Ala Thr Arg Leu Arg Asp
1170 1175 1180

Ala Ile Ser Trp Phe Val Glu Pro Asp Ser Lys Leu Ala Met Thr Ile
1185 1190 1195 1200

Leu Ser Asn Ile His Ser Leu Thr Gly Glu Glu Trp Thr Lys Arg Gln
1205 1210 1215

His Gly Phe Lys Arg Thr Gly Ser Ala Leu His Arg Phe Ser Thr Ser
1220 1225 1230

Arg Met Ser His Gly Gly Phe Ala Ser Gln Ser Thr Ala Ala Leu Thr
1235 1240 1245

Arg Leu Met Ala Thr Thr Asp Thr Met Arg Asp Leu Gly Asp Gln Asn
1250 1255 1260

Phe Asp Phe Leu Phe Xaa Ala Thr Leu Leu Tyr Ala Xaa Ile Thr Thr
1265 1270 1275 1280

Thr Val Ala Arg Asp Gly Trp Ile Thr Ser Cys Thr Asp His Tyr His
1285 1290 1295

Ile Ala Cys Lys Ser Cys Leu Arg Pro Ile Glu Glu Ile Thr Leu Asp
1300 1305 1310

Ser Ser Met Asp Tyr Thr Pro Pro Asp Val Ser His Val Leu Lys Thr
1315 1320 1325

Trp Arg Asn Gly Glu Gly Ser Trp Gly Gln Glu Ile Lys Gln Ile Tyr
1330 1335 1340

Pro Leu Glu Gly Asn Trp Lys Asn Leu Ala Pro Ala Glu Gln Ser Tyr
1345 1350 1355 1360

Gln Val Gly Arg Cys Ile Gly Phe Leu Tyr Gly Asp Leu Ala Tyr Arg
1365 1370 1375

Lys Ser Thr His Ala Glu Asp Ser Ser Leu Phe Pro Leu Ser Ile Gln
1380 1385 1390

Gly Arg Ile Arg Gly Arg Gly Phe Leu Lys Gly Leu Leu Asp Gly Leu
1395 1400 1405

Met Arg Ala Ser Cys Cys Gln Val Ile His Arg Arg Ser Leu Ala His
1410 1415 1420

Leu Lys Arg Pro Ala Asn Ala Val Tyr Gly Gly Leu Ile Tyr Leu Ile
1425 1430 1435 1440

Asp Lys Leu Ser Val Ser Pro Pro Phe Leu Ser Leu Thr Arg Ser Gly
1445 1450 1455

Pro Ile Arg Asp Glu Leu Glu Thr Ile Pro His Lys Ile Pro Thr Ser
1460 1465 1470

Tyr Pro Thr Ser Asn Arg Asp Met Gly Val Ile Val Arg Asn Tyr Phe
1475 1480 1485

Lys Tyr Gln Cys Arg Leu Ile Glu Lys Gly Lys Tyr Arg Ser His Tyr
1490 1495 1500

Ser Gln Leu Trp Leu Phe Ser Asp Val Leu Ser Ile Asp Phe Ile Gly
1505 1510 1515 1520

Pro Phe Ser Ile Ser Thr Thr Leu Leu Gln Ile Leu Tyr Lys Pro Phe
1525 1530 1535

Leu Ser Gly Lys Asp Lys Asn Glu Leu Arg Glu Leu Ala Asn Leu Ser
1540 1545 1550

Ser Leu Leu Arg Ser Gly Glu Gly Trp Glu Asp Ile His Val Lys Phe
1555 1560 1565

Phe Thr Lys Asp Ile Leu Leu Cys Pro Glu Glu Ile Arg His Ala Cys
1570 1575 1580

Lys Phe Gly Ile Ala Lys Asp Asn Asn Lys Asp Met Ser Tyr Pro Pro
1585 1590 1595 1600

Trp Gly Arg Glu Ser Arg Gly Thr Ile Thr Thr Ile Pro Val Tyr Tyr
1605 1610 1615

Thr Thr Thr Pro Tyr Pro Lys Met Leu Glu Met Pro Pro Arg Ile Gln
1620 1625 1630

Asn Pro Leu Leu Ser Gly Ile Arg Leu Gly Gln Leu Pro Thr Gly Ala
1635 1640 1645

His Tyr Lys Ile Arg Ser Ile Leu His Gly Met Gly Ile His Tyr Arg
1650 1655 1660

Asp Phe Leu Ser Cys Gly Asp Gly Ser Gly Gly Met Thr Ala Ala Leu
1665 1670 1675 1680

Leu Arg Glu Asn Val His Ser Arg Gly Ile Phe Asn Ser Leu Leu Glu
1685 1690 1695

Leu Ser Gly Ser Val Met Arg Gly Ala Ser Pro Glu Pro Pro Ser Ala
1700 1705 1710

Leu Glu Thr Leu Gly Gly Asp Lys Ser Arg Cys Val Asn Gly Glu Thr
1715 1720 1725

Cys Trp Glu Tyr Pro Ser Asp Leu Cys Asp Pro Arg Thr Trp Asp Tyr
1730 1735 1740

Phe Leu Arg Leu Lys Ala Gly Leu Gly Leu Gln Ile Asp Leu Ile Val
1745 1750 1755 1760

Met Asp Met Glu Val Arg Asp Ser Ser Thr Ser Leu Lys Ile Glu Thr
1765 1770 1775

Asn Val Arg Asn Tyr Val His Arg Ile Leu Asp Glu Gln Gly Val Leu
1780 1785 1790

Ile Tyr Lys Thr Tyr Gly Thr Tyr Ile Cys Glu Ser Glu Lys Asn Ala
1795 1800 1805

Val Thr Ile Leu Gly Pro Met Phe Lys Thr Val Asp Leu Val Gln Thr
1810 1815 1820

Glu Phe Ser Ser Ser Gln Thr Ser Glu Val Tyr Met Val Cys Lys Gly
1825 1830 1835 1840

Leu Lys Lys Leu Ile Asp Glu Pro Asn Pro Asp Trp Ser Ser Ile Asn
1845 1850 1855

Glu Ser Trp Lys Asn Leu Tyr Ala Phe Gln Ser Ser Glu Gln Glu Phe
1860 1865 1870

Ala Arg Ala Lys Lys Val Ser Thr Tyr Phe Thr Leu Thr Gly Ile Pro
1875 1880 1885

Ser Gln Phe Ile Pro Asp Pro Phe Val Asn Ile Glu Thr Met Leu Gln
1890 1895 1900

Ile Phe Gly Val Pro Thr Gly Val Ser His Ala Ala Ala Leu Lys Ser
1905 1910 1915 1920

Ser Asp Arg Pro Ala Asp Leu Leu Thr Ile Ser Leu Phe Tyr Met Ala
1925 1930 1935

Ile Ile Ser Tyr Tyr Asn Ile Asn His Ile Arg Val Gly Pro Ile Pro
1940 1945 1950

Pro Asn Pro Pro Ser Asp Gly Ile Ala Gln Asn Val Gly Ile Ala Ile
1955 1960 1965

Thr Gly Ile Ser Phe Trp Leu Ser Leu Met Glu Lys Asp Ile Pro Leu
1970 1975 1980

Tyr Gln Gln Cys Leu Ala Val Ile Gln Gln Ser Phe Pro Ile Arg Trp
1985 1990 1995 2000

Glu Ala Val Ser Val Lys Gly Gly Tyr Lys Gln Lys Trp Ser Thr Arg
2005 2010 2015

Gly Asp Gly Leu Pro Lys Asp Thr Arg Ile Ser Asp Ser Leu Ala Pro
2020 2025 2030

Ile Gly Asn Trp Ile Arg Ser Leu Glu Leu Val Arg Asn Gln Val Arg
2035 2040 2045

Leu Asn Pro Phe Asn Glu Ile Leu Phe Asn Gln Leu Cys Arg Thr Val
2050 2055 2060

Asp Asn His Leu Lys Trp Ser Asn Leu Arg Lys Asn Thr Gly Met Ile
2065 2070 2075 2080

Glu Trp Ile Asn Arg Arg Ile Ser Lys Glu Asp Arg Ser Ile Leu Met
2085 2090 2095

Leu Lys Ser Asp Leu His Glu Glu Asn Ser Trp Arg Asp
2100 2105